SLV-383/X55DH/X55ME

RMT-V109A

SERVICE MANUAL

Israeli Model
SLV-383

Chinese Model
Hong Kong Model
SLV-X55DH

ME Model
SLV-X55ME

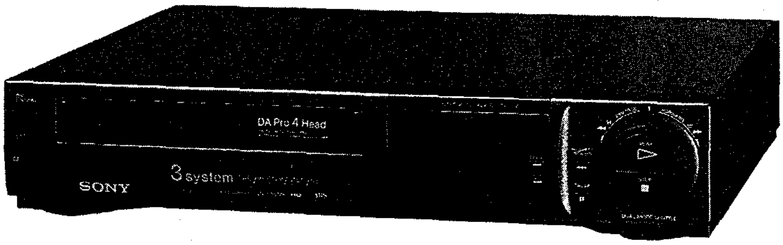

Photo : SLV-X55ME

Remote commander RMT-V109A is available as a unit, but individual parts the battery case lid of commander is only available.

For MECHANICAL ADJUSTMENTS, refer to the "VHS MECHANICAL ADJUSTMENT MANUAL II" (9-972-816-11)

SPECIFICATIONS

System

Channel coverage	PAL B/G : VHF channels 2 to 12, S01 to S05, S1 to S20 (S10 (383)) UHF channels 21 to 69 CATV channels S11 to S41 (383) SECAM D/K : VHF channels R1 to R12 UHF channels 21 to 69 PAL D/K : VHF channels C1 to C12 UHF channels C13 to C56 PAL 1 : (X55DH) UHF channels 21 to 69
RF output signal	UHF channels 30 to 39 (C22 to C26 (X55DH))
Aerial out	75-ohm asymmetrical aerial socket

Inputs and outputs

LINE IN 1 and 2	VIDEO IN (phono jack) (1 each) Input signal : 1Vp-p, 75 ohms, unbalanced, sync negative AUDIO IN (phono jack) (1 each) Input level : −7.5dBs (0dBs = 0.775Vrms) Input impedance : more than 47 kilohms
LINE OUT	VIDEO OUT (phono jack) (1) Output signal : 1Vp-p, 75 ohms, unbalanced, sync negative AUDIO OUT (phono jack) (1) Rated output : −7.5dBs at load impedance 47 kilohms Output impedance : less than 10 kilohms

General

Power requirements	110−240V AC, 50/60Hz
Power consumption	27W
Operating temperature	5℃ to 40℃ (41° F to 104° F)
Storage temperature	−20℃ to 60℃ (−4° F to 140° F)
Dimensions	430×87×363mm (w/h/d) (17×3½×14⅜ inches) including projecting parts and controls
Weight	5.7kg (12 lb 9 oz)

— Continued on page 2 —

VHS VIDEO CASSETTE RECORDER

SONY®

MICROFILM

Accessories supplied

Wireless Remote Commander with two R6 (size AA) batteries (1)
Aerial cable (1)
Screwdriver for RF channel adjustment (1)
AC power cord (1)
AC pluu adaptor (1) (X55ME)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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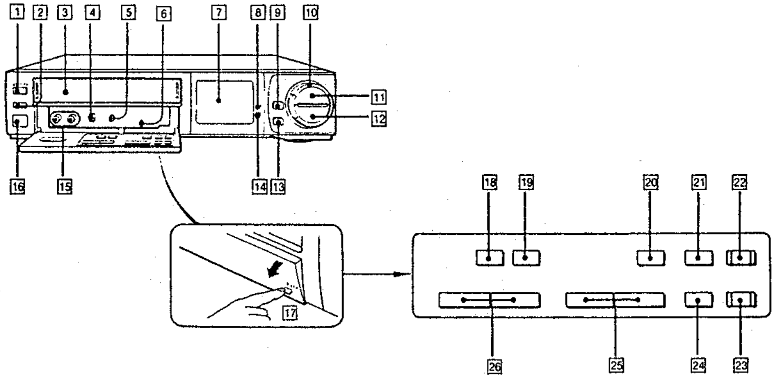
Identifying Parts and Controls

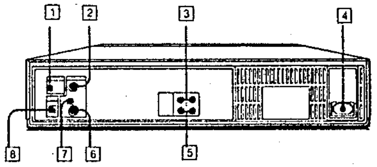
Refer to pages shown in the parentheses for details.

Front Panel



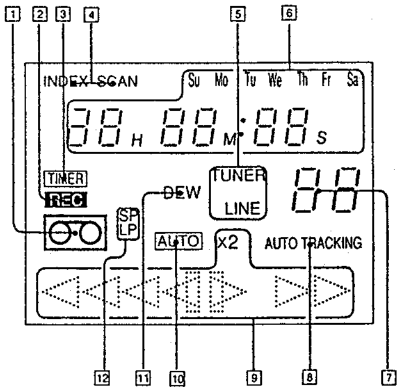
1 ON/STANDBY switch and indicator
2 ⏏ EJECT button (page 13)
3 Cassette compartment (page 13)
4 COLOUR SYSTEM selector (page 14)
5 SHARPNESS SOFT/SHARP control (page 15)
6 CL (clear) button (page 34)
7 Display window
8 RENTAL PICTURE indicator (page 15)
9 ◀◀◀ HI-SPEED REWIND button (page 14)
10 DUAL MODE SHUTTLE ring (pages 14, 24 and 25)
11 ▶ PLAY button (pages 14, 24 and 25)
12 ■ STOP button (pages 15, 17 and 28)
13 ⏸ PAUSE button (pages 18 and 24)
14 NTSC PB indicator (page 14)
15 LINE IN 2 AUDIO/VIDEO jacks (page 28)
16 Remote sensor (page 6)
17 ▼ OPEN projection
18 INPUT SELECT button (pages 7, 10, 17, 20, 26 and 28)
19 REC MODE (SP/LP) button (pages 17, 20, 26 and 28)
20 RENTAL PICTURE button (page 15)
21 QUICK TIMER button (page 26)
22 TIMER REC ON/OFF button (pages 20, 21, 22 and 26)
23 ● REC button (page 17)
24 TRACKING AUTO/MANUAL button (page 16)
25 TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼ buttons (page 16, 24 and 25)
26 PROGRAM +/– buttons (pages 7, 17, 20 and 26)

Rear Panel



1 RF CHANNEL screw (page 7)
2 AERIAL OUT connector (page 4)
3 LINE IN 1 AUDIO/VIDEO jacks (page 28)
4 AC inlet
5 LINE OUT AUDIO/VIDEO jacks (pages 4 and 29)
6 AERIAL IN connector (page 4)
7 LOCAL/DX switch (page 7)
8 TV SYSTEM (G/K) selector (page 5)

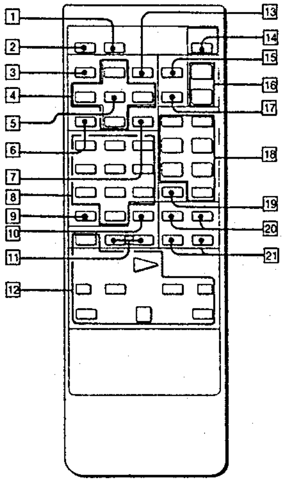
Indications in the Display Window



1 Cassette indicator (Appears when a cassette is loaded.)
2 REC (recording) indicator
3 TIMER recording indicator
4 INDEX and SCAN indicators
5 Input mode indicators (TUNER, LINE)
6 Linear tape counter and clock
7 Program position/LINE number (L1, L2) indicator
8 AUTO TRACKING indicator
9 Tape operation indicator
10 AUTO indicator
11 DEW (moisture condensation) indicator (page 34)
12 Tape speed indicator (SP, LP)

Remote Commander

The buttons on the Remote Commander with the same name or mark as those on the VTR have the same function.
You can use the buttons in the "TV" section to remotely control Sony TVs with the ◙ mark.



1 TIMER CLEAR button (page 22)
2 TIMER REC (ON/OFF) button (pages 20, 21, 22 and 26)
3 MENU button (pages 8, 10, 19, 22 and 26)
4 ▲/▼/◀/▶ (cursor) buttons
5 EXECUTE button (pages 8, 9, 10, 12, 20 and 22)
6 INPUT SELECT button (pages 7, 10, 17, 20, 26 and 28)
7 INDEX button (page 27)
8 Program position number buttons (pages 11, 17 and 20)
9 -/-- button (pages 10, 11, 17 and 20)
10 x2 button (page 24)
11 ● REC (record) buttons (pages 17 and 28)
12 Tape transport buttons
    - ⏸ PAUSE (pages 18 and 24)
    - ▶ PLAY (pages 14, 24 and 25)
    - ⏪/⏩ SEARCH (page 24)
    - ◀◀ REW (rewind) (pages 14, 24 and 27)
    - ▶▶ FF (fast-forward) (pages 14, 24 and 27)
    - ◀◀◀ HI-SPEED REWIND (page 14)
    - ■ STOP (pages 14 and 17)
    - SKIP (page 14)
13 REC MODE (recording mode) button (pages 17, 20, 26 and 28)
14 ⏻ (power) switch
15 CLOCK/COUNTER button (pages 15 and 17)
16 PROG +/– buttons (pages 17, 20 and 26)
17 COUNTER RESET button (pages 15, 17, 21 and 26)
18 TV control buttons
    - ⏻ (power) switch (page 6)
    - ○ (power) switch (page 6)
    - PROG +/– buttons (page 6)
    - VOL (volume) +/– buttons (page 6)
    - TV/VIDEO button (page 6)
19 DATA SCREEN button (pages 14, 17 and 21)
20 < DIRECTION > ◀II/II▶ buttons (pages 24 and 25)
21 I▶ SLOW+/– buttons (page 24)

This section is extracted from SLV-X55DH instruction manual.

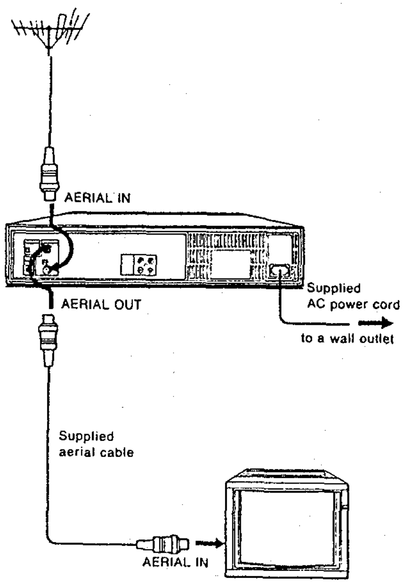
Connections

Turn all the power off before making connections.
Connect the AC power cord last.

Connecting an Aerial and a TV

Whenever you view video pictures as well as TV programs on your TV screen, connect an aerial and a TV as shown below.

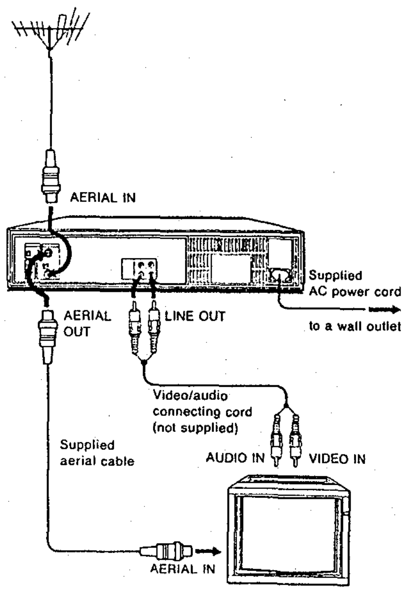
When your TV is equipped only with an aerial input terminal


AERIAL IN
AERIAL OUT
Supplied AC power cord
to a wall outlet
Supplied aerial cable
AERIAL IN

1. Disconnect the aerial from the aerial input terminal of the TV, and connect the aerial to the AERIAL IN of this VTR.
2. Connect the AERIAL OUT of this VTR to the aerial input terminal of the TV, using the supplied aerial cable.

Note
Connect the plug firmly to avoid picture distortion.

When your TV is equipped with video/audio input jacks


AERIAL IN
Supplied AC power cord
to a wall outlet
AERIAL OUT
LINE OUT
Video/audio connecting cord (not supplied)
Supplied aerial cable
AUDIO IN
VIDEO IN
AERIAL IN

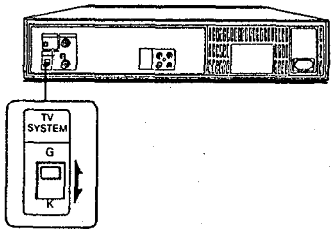
1. Disconnect the aerial from the aerial input terminal of the TV, and connect the aerial to the AERIAL IN of this VTR.
2. Connect the AERIAL OUT of this VTR to the aerial input terminal of the TV, using the supplied aerial cable.
3. Connect the LINE OUT jacks of this VTR to the video/audio input jacks of the TV with a video/audio connecting cord (not supplied, such as VMC-710MP/720MP).
   In this way, you can get a higher quality picture.

Note
Connect the plug firmly to avoid picture distortion.

If your TV is a stereo type
Use the VMC-910MS/920MS connecting cord (not supplied).

Selecting the TV System

Before you operate the VTR, make sure that the TV SYSTEM selector at the rear is set to the system in your area.
Change the position of the selector, if necessary.
G: PAL G or SECAM G system
K: PAL K or SECAM K system


TV SYSTEM
G
K

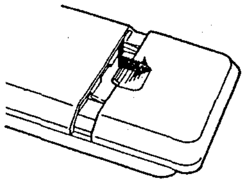
Note
The sound is distorted if the TV SYSTEM selector is set to the wrong position.

Preparing the Remote Commander

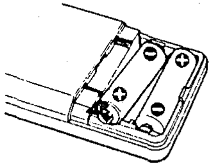
Before using the supplied Remote Commander, insert the correct batteries into the Remote Commander.

Inserting Batteries

1. Slide and remove the cover.



2. Insert two R6 (size AA) batteries so that the ⊕ and ⊖ polarities match the polarity diagrams inside the battery compartment.



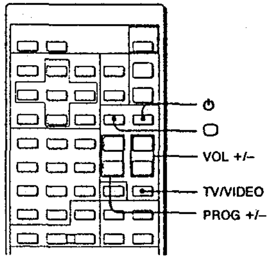
3. Close the cover.

Note on batteries
With normal operation, batteries will last for about six months. If the Remote Commander is not used for a long period of time, remove the batteries to avoid possible damage from battery leakage.

How to Use the Remote Commander

When you operate the VTR using the Remote Commander, point it to the remote sensor of the VTR. For the location of the remote sensor, see "Identifying Parts and Controls" on page 30.

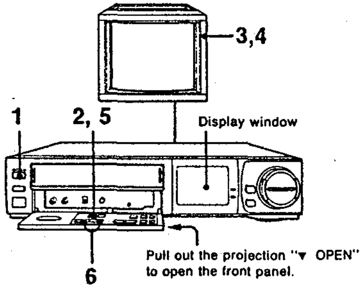
How to control your TV with the Remote Commander
This Remote Commander can also control your Sony TV with the 🆁 mark.
Buttons used to control the TV are shown below.



⏻	: Press to turn the power of the TV on and off.
▢	: If the power of the TV is not turned on by pressing ⏻, press this button to turn it on.
VOL +/–	: Press to increase (+) or decrease (–) the volume of the TV.
TV/VIDEO	: Press to select the input of the TV; TV program broadcasts from the antenna or playback signal from the VTR.
PROG +/–	: Press to change the program position of the TV.

Adjusting the TV

If you have connected your VTR and TV using only the aerial sockets, you have to adjust one of the television program channels to receive the VTR's playback signals. If the TV-VTR connection is made using the video/audio input and output jacks, skip this procedure.



Pull out the projection "▼ OPEN" to open the front panel.

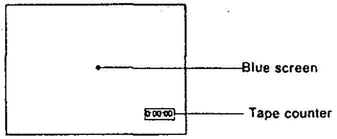
1. Press ON/STANDBY to turn on the VTR.

2. Press INPUT SELECT to light LINE L2 in the display window.

   Note
   Do not connect any equipment to the LINE IN 2 jacks on the front of the VTR.

3. Turn on the TV and select the UHF channel 32. The VTR is preset at the factory so that it outputs the UHF channel 32 band signal to the TV. If the UHF channel 32 is used in your area, readjust the program position for the VTR as described in "When the UHF channel 32 is used" on this page.

4. Tune the TV so that a blue screen with the tape counter indication is clearly displayed on the TV screen.

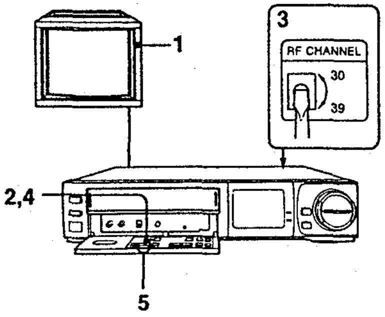


5. Press INPUT SELECT to light TUNER in the display window.

6. Press PROGRAM +/– to check to see if the TV screen changes to a different program.

Now you have tuned your TV to receive the VTR's playback picture. When you play back a tape, select the same program position you chose in step 3.

When the UHF channel 32 is used
Readjust the program position for the VTR.



1. Select a program position on the TV between UHF channels 30 and 39, where the TV shows no picture and a steady rustling sound or where no sound is heard.

2. Press INPUT SELECT to light LINE L2 in the display window

3. Turn the RF CHANNEL screw with the supplied screwdriver to the position where the TV clearly displays a blue screen with tape counter.

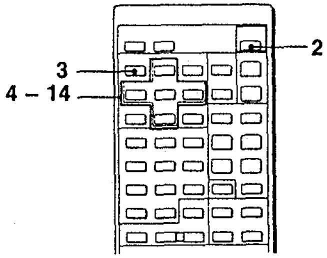
4. Press INPUT SELECT to light TUNER in the display window.

5. Press PROGRAM +/– to check to see if the TV screen changes to a different program.

If the TV signal is too strong
Set the LOCAL/DX switch at the rear of the VTR to LOCAL with a screwdriver.
Normally set this switch to DX.

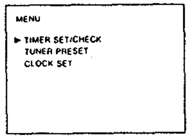
Setting Date and Clock

Set the clock of the VTR to the current time and date. You can set the clock with the Remote Commander while looking at the display on the TV screen.

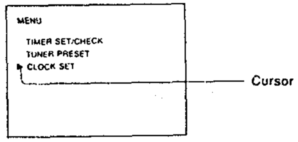


Example: To set to 15:30, 27th November, 1991

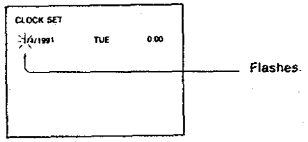
1. Turn on the TV.
   If your TV is connected to both AERIAL OUT and LINE OUT of the VTR:
   Select the input from the VTR.
   If your TV is connected only to the AERIAL OUT of the VTR:
   Select the program position for the VTR.
2. Press ⏻ to turn on the VTR.
3. Press MENU.
   The main MENU appears on the TV screen


MENU
▶ TIMER SET/CHECK
TUNER PRESET
CLOCK SET

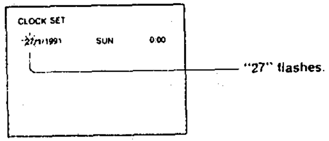
4. Press ▲ or ▼ to move the cursor (▶) to CLOCK SET.


MENU
TIMER SET/CHECK
TUNER PRESET
▶ CLOCK SET
Cursor

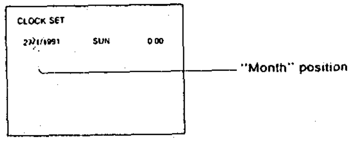
5. Press EXECUTE.
   "1/1/1991 TUE 0:00" appears.
   The leftmost "1", in the "day" position, is flashing.


CLOCK SET
1/1/1991 TUE 0:00
Flashes.

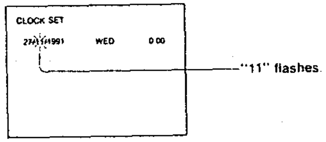
6. Press ▲ or ▼ until "27" appears in the day position.
   The day of the week is automatically set.


CLOCK SET
27/1/1991 SUN 0:00
"27" flashes.

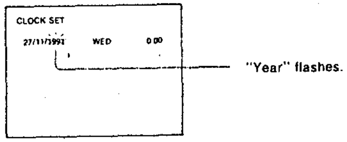
7. Press ▶ to make the "month" position flash.


CLOCK SET
27/1/1991 SUN 0:00
"Month" position

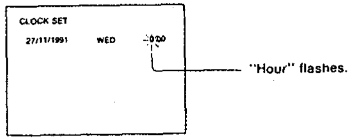
8. Press ▲ or ▼ until "11" appears in the month position.


CLOCK SET
27/11/1991 WED 0:00
"11" flashes.

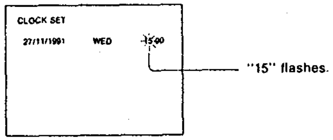
9. Press ▶ to make the "year" position flash.
   If you want to change the year, press ▲ or ▼.


CLOCK SET
27/11/1991 WED 0:00
"Year" flashes.

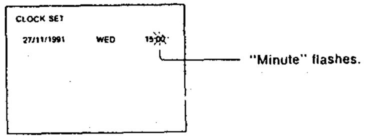
10. Press ▶ to make the "hour" flash.


CLOCK SET
27/11/1991 WED 0:00
"Hour" flashes.

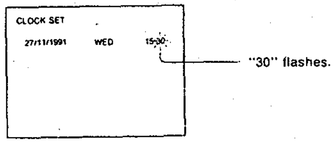
11. Press ▲ or ▼ until "15" appears in the hour position.


CLOCK SET
27/11/1991 WED 15:00
"15" flashes.

12. Press ▶ to make the "minute" flash.


CLOCK SET
27/11/1991 WED 15:00
"Minute" flashes.

13. Press ▲ or ▼ until "30" appears in the minute position.


CLOCK SET
27/11/1991 WED 15:30
"30" flashes.

14. Press EXECUTE.
    The clock is set to 15:30 00 second.

To recall the date and clock onto the screen

Press MENU to display the main MENU, select CLOCK SET and press EXECUTE.

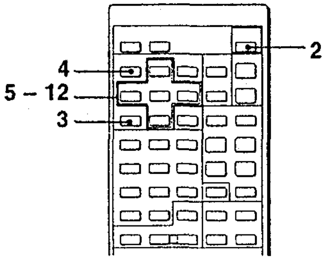
Notes

- You can set the clock except during timer-activated recording, timer recording standby, and quick-timer recording.
- When the date and clock are called up on the screen, the clock keeps running as long as no modification is made. The seconds will not be reset to 00 when you return to the original screen.

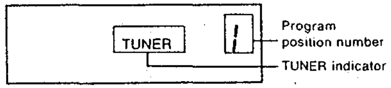
Presetting the Active Channels

To watch and record a TV program, you have to preset channels on the VTR.
You can preset the preferred channels using the Remote Commander and the TUNER PRESET display.

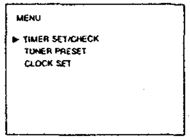
Presetting Desired Channels



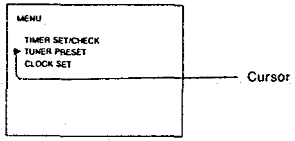
1. Turn on the TV.
   If your TV is connected to both AERIAL OUT and LINE OUT of the VTR:
   Select the input from the VTR.
   If your TV is connected only to the AERIAL OUT of the VTR:
   Select the program position for the VTR.
2. Press ⏻ to turn on the VTR.
3. Press INPUT SELECT so that the TUNER indicator and the program position number appear in the display window.



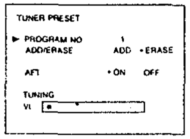
4. Press MENU.
   The main MENU appears on the TV screen.


MENU
▶ TIMER SET/CHECK
TUNER PRESET
CLOCK SET

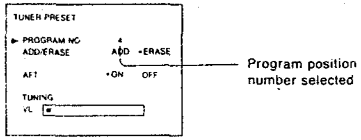
5. Press ▲ or ▼ to move the cursor (▶) to TUNER PRESET.


MENU
TIMER SET/CHECK
▶ TUNER PRESET
CLOCK SET

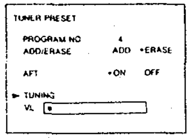
6. Press EXECUTE.
   The TUNER PRESET display appears.


TUNER PRESET
▶ PROGRAM NO 1
ADD/ERASE ADD •ERASE
AFT •ON OFF
TUNING
VL

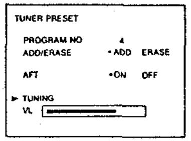
7. Press ◀ or ▶ to select the desired program position number.
   You can use the program position number buttons to select a number directly. (To select a number over 9, press -/--, and then the 2-digit number desired.)


TUNER PRESET
▶ PROGRAM NO 4
ADD/ERASE ADD •ERASE
AFT •ON OFF
TUNING
VL

8. Press ▲ or ▼ to move the cursor to TUNING.


TUNER PRESET
PROGRAM NO 4
ADD/ERASE ADD •ERASE
AFT •ON OFF
▶ TUNING
VL

9. Press ◀ or ▶ to tune in the desired channel.
   The picture appears when the first channel received in your area is detected, and the channel is preset to the selected program position.
   If ERASE has been selected, ADD/ERASE is switched to ADD automatically, and the screen returns to the blue background after 5 seconds.


TUNER PRESET
PROGRAM NO 4
ADD/ERASE •ADD ERASE
AFT •ON OFF
▶ TUNING
VL

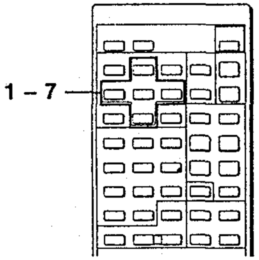
10. If the channel detected in step 9 is not the desired one, press ◀ or ▶ until the picture of the desired channel appears.

Note
When you keep ◀ or ▶ pressed, the channels are scanned in the following order:

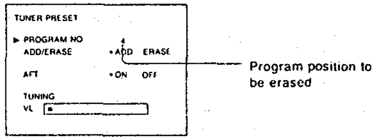
Band Indicator	Corresponding channels		
	PAL B/G	PAL D/K	SECAM D/K
VL (VHF low)	VHF 2 to 4 S01 to S05	VHF C1 to C5	VHF R1 to R5
↕ VH (VHF high)	VHF 5 to 12 S1 to S10	VHF C6 to C12	VHF R6 to R12
↕ VS (hyper VHF)	S11 to S41	–	–
↕ U (UHF)	UHF 21 to 69	UHF C13 to C56	UHF 21 to 69

11. Press ▲ to move the cursor to PROGRAM NO., and repeat steps 7 to 10 to preset other channels to other program positions.
12. Press EXECUTE when all the desired channels have been preset.
    The display returns to the original screen with the tape counter.

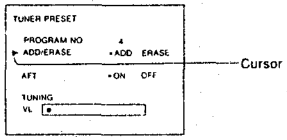
Erasing Unnecessary Program Positions



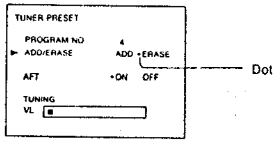
1. Call up the TUNER PRESET menu on the TV screen. Follow steps 4 to 6 in "Presetting Desired Channels" (page 10).
2. Press ▲ or ▼ to move the cursor (▶) to PROGRAM NO.
3. Press ◀ or ▶ to select the program position number to be erased.
   You can use the program position number buttons to select a number directly. (To select a number over 9, press -/--, and then the 2-digit number desired.)


TUNER PRESET
▶ PROGRAM NO 4
ADD/ERASE •ADD ERASE
AFT •ON OFF
TUNING
VL

4. Press ▲ or ▼ to move the cursor to ADD/ERASE.


TUNER PRESET
PROGRAM NO 4
▶ ADD/ERASE •ADD ERASE
AFT •ON OFF
TUNING
VL

5. Press ▶ to move the dot (•) to ERASE.


TUNER PRESET
PROGRAM NO 4
▶ ADD/ERASE ADD •ERASE
AFT •ON OFF
TUNING
VL

6. Repeat steps 2 to 5 to erase other program positions.

7. Press EXECUTE.
When pressing PROG +/– (PROGRAM +/–), the erased program positions will be skipped.

To enter the erased program position again
Press ◀ to select ADD instead of ERASE in step 5 above.

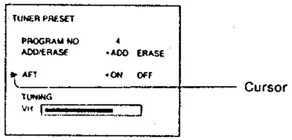
When You Cannot Get Fine Tuning

Normally the AFT (Auto Fine Tuning) function works and fine-tunes the picture.
However, if you cannot get fine tuning, follow the procedure below.

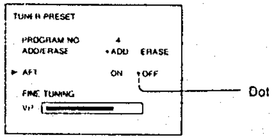
1. Select the program position to be fine tuned with PROG +/–, or by pressing the program position number buttons.
(To select a number over 9, press -/--, and then the 2-digit number desired.)

2. Call up the TUNER PRESET display.
Follow steps 4 to 6 in "Presetting Desired Channels." (page 10)

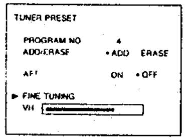
3. Press ▲ or ▼ to move the cursor (▶) to AFT.


TUNER PRESET
PROGRAM NO 4
ADD/ERASE •ADD ERASE
▶ AFT •ON OFF
TUNING
VH

4. Press ▶ to move the dot (•) to OFF.
FINE TUNING appears.


TUNER PRESET
PROGRAM NO 4
ADD/ERASE •ADD ERASE
▶ AFT ON •OFF
FINE TUNING
VH

5. Press ▲ or ▼ to move the cursor to FINE TUNING.


TUNER PRESET
PROGRAM NO 4
ADD/ERASE •ADD ERASE
AFT ON •OFF
▶ FINE TUNING
VH

6. Press ◀ or ▶ until you get the best picture.

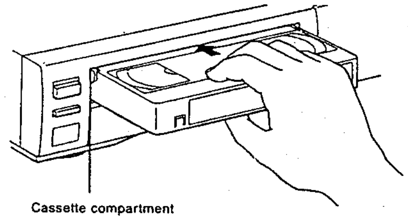
If you still cannot get a better picture
Press ▲ to move the cursor to AFT, and press ◀ to move the dot (•) to ON

7. Press EXECUTE.

Playback

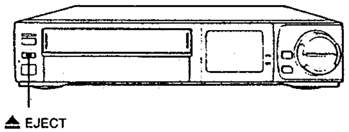
This section shows you how to insert a video cassette into the VTR and to play it back.

Inserting a Video Cassette



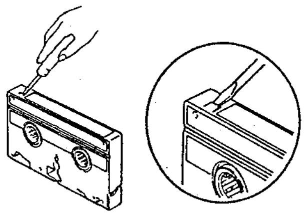
Insert the cassette into the cassette compartment by slowly pressing its center with the arrow on the top.
When the cassette is loaded, the VTR automatically turns on.

Ejecting the video cassette



Press ▲ EJECT on the VTR.
You can eject the cassette even when the power is off, as long as the AC power cord is connected to the wall outlet.

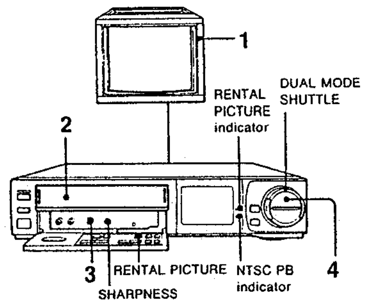
Protecting your cassette from being erased
The cassette is provided with a safety tab to protect against an accidental recording. Remove the tab with a screwdriver or a similar tool as shown.
When you attempt to start recording while inserting a cassette with its safety tab removed, the cassette is automatically ejected.

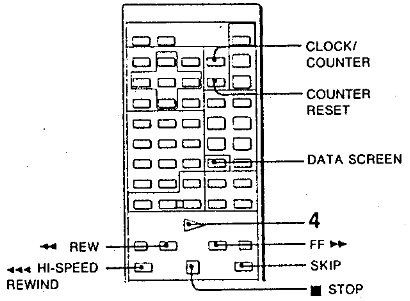


If you want to record again on the cassette without its safety tab, simply cover the safety tab slot with a piece of plastic tape.

Playing Back a Cassette

Before playing back the cassette, check that all the connections are made correctly.





1. Turn on the TV.
   If your TV is connected to both AERIAL OUT and LINE OUT of the VTR:
   Select the input from the VTR.
   If your TV is connected only to the AERIAL OUT of the VTR:
   Select the program position for the VTR.

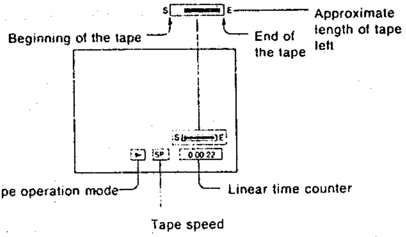
2. Insert the cassette.
   The VTR turns on automatically.
   When you insert a cassette without safety tab, playback starts automatically.

3. Set COLOUR SYSTEM on the VTR to conform to the color system of the cassette to be played.
   To play back a cassette recorded with the PAL or ME SECAM color system, set to PAL/MESECAM.
   To play back a cassette recorded with the NTSC color system, set to NTSC PB ON PAL TV. The NTSC PB indicator lights up.

   Notes
   - When you play back a cassette recorded in the NTSC color system, note that the following occurs:
     - – The data screen does not appear on the screen, even if you press the DATA SCREEN button.
     - – The picture may go black and white, shake, or shrink a bit. It depends on the TV you have.
     - – When you rewind or advance the tape after you have played it, the VTR may not run smoothly, since it takes a while for the VTR to count the length of tape left before rewinding/advancing the tape.
   - When the PAL and NTSC color systems are mixed on a tape, the counter does not show the exact counting, since each color system has a different counting cycle.

4. Press ► PLAY.
   Playback starts.
   When the tape reaches the end, the VTR automatically rewinds the tape to the beginning (auto rewind). The power of the VTR remains on.

The following information (data screen) appears on the TV screen.



To turn off the data screen information
Press DATA SCREEN on the Remote Commander
To display it again, press DATA SCREEN.

Notes on the data screen
- The remaining tape length shows the approximate length of tape left.
- When you insert a short tape such as E30 or non-standard commercially available tape, the remaining tape length indicator may not function correctly.
- The data screen cannot be called up on the screen during still mode (page 24) or slow motion playback (page 24).

To stop playback
Press ■ STOP.
Every time you have played back a cassette recorded in the NTSC color system, be sure to reset the COLOUR SYSTEM switch to the PAL position.

To rapidly advance the tape
Press ■ STOP, and turn the DUAL MODE SHUTTLE ring on the VTR to the right (►►), or press FF ►► on the Remote Commander.

To rewind the tape
Press ■ STOP, and turn the DUAL MODE SHUTTLE ring on the VTR to the left (◄◄), or press ◄◄ REW on the Remote Commander.
To rewind the tape at higher speed, press ◄◄◄ HI-SPEED REWIND.

To start playback automatically after rewinding the tape
Turn the DUAL MODE SHUTTLE ring on the VTR to the left (◄◄).
While holding the ring, press ► PLAY on the VTR.
To rewind the tape at higher speed, while holding down ◄◄◄ HI-SPEED REWIND, press ► PLAY on the VTR.
During rewind, the AUTO indicator lights in the display window.

To skip unwanted scene
During playback, press SKIP. The tape portion of about 30 seconds long is fast-forwarded, and then normal playback resumes.

Enhancing the picture quality

■ To reduce noise
Press RENTAL PICTURE on the VTR so that the RENTAL PICTURE indicator lights up. After playback of that particular tape, press RENTAL PICTURE again to turn off the indicator.

■ To adjust the sharpness of the picture
Turn SHARPNESS control on the VTR to SHARP for a sharper picture or to SOFT for a softer picture.

Auto head cleaner and its benefit

The auto head cleaner built into the VTR automatically cleans the video heads when a cassette is loaded or unloaded. If the effect of head cleaning is not sufficient even after a cassette has been loaded/unloaded several times, clean the heads using the Sony T-25CL video head cleaning cassette.

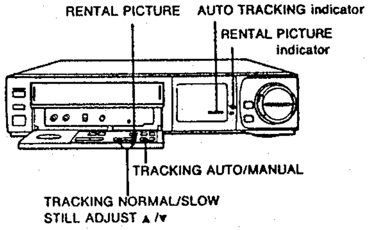
Resetting the tape counter

The tape counter in the display window helps you to locate a certain scene after playback. Press COUNTER RESET on the Remote Commander to set the counter to the "0H00M00S" (counter zero) position before playing back the tape (the tape counter is automatically reset to zero whenever a cassette is inserted). The VTR keeps counting the length of the tape being played back.
Note, however, that the tape counter does not count the portions without video signals recorded.

Note
If the display window shows the current clock, not the tape counter, press CLOCK/COUNTER on the Remote Commander to switch the display to tape counter.

Playing Back a Cassette Recorded on Another VTR

When playing back a tape recorded on another VTR, we recommend that you make the following adjustments to obtain a better picture.



To reduce playback noise
Press RENTAL PICTURE on the VTR so that the RENTAL PICTURE indicator lights up. After playback, press RENTAL PICTURE again to turn off the indicator.

Adjusting pictures manually

Normally you can get optimum tracking since the auto tracking function activates in the following cases:

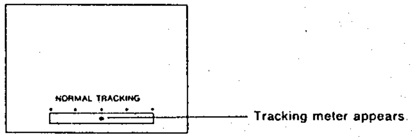
- when the cassette is loaded for the first time.
- when the recording mode on the playback tape is switched between SP and LP. (See page 18 for the recording mode.)
- when the picture is distorted by scratches on the tape.
- when the AUTO TRACKING indicator is turned on by pressing TRACKING AUTO/MANUAL after the picture is adjusted manually.

The AUTO TRACKING indicator flashes while the VTR is searching for the best tracking condition, and lights when the best possible playback picture is obtained.

AUTO TRACKING
Flashes.

When streaks or snow noise appear on the picture, adjust the picture manually.

Press TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼ to obtain the best possible picture.
The tracking meter appears on the TV screen and the AUTO TRACKING indicator goes off.



Note
When DATA SCREEN on the Remote Commander is pressed, the tracking meter will not appear on the TV screen.

To return to the auto tracking adjustment
Press TRACKING AUTO/MANUAL.

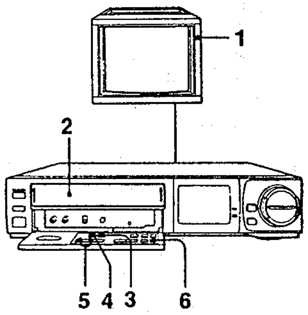
Notes on manual tracking adjustment

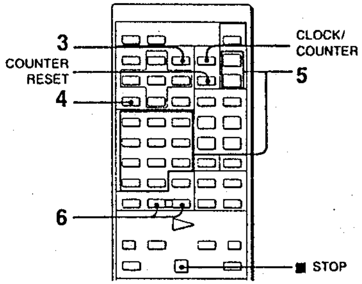
- When the manual adjustment proves unsatisfactory, press both of TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼
  The tracking condition returns to the center position.
- Tracking adjustment is not possible when the recording condition of the tape is very poor.
- While auto tracking adjustment is working, streaks or noise may appear.

Recording

This section shows you how to record TV programs.
You can also watch a TV program on the TV screen while recording another.
Before recording, check to see that all the connections have been made correctly.

Recording TV Programs





1. Turn on the TV.
   If your TV is connected to both AERIAL OUT and LINE OUT of the VTR:
   Select the input from the VTR.
   If your TV is connected only to the AERIAL OUT of the VTR:
   Select the program position for the VTR.

2. Insert the cassette.
   The VTR turns on automatically.

3. Press REC MODE to select the recording tape speed, SP or LP. (See page 18 for the maximum recording time of a tape in each tape speed.)

4. Press INPUT SELECT to light the TUNER indicator in the display window.

5. Select the program to be recorded with PROG +/– (PROGRAM +/–), or by pressing program number buttons. (To select a number over 9, press -/--, and then the 2-digit number desired.)

6. Press the two ● REC buttons on the Remote Commander simultaneously, or the ● REC button on the VTR.
   Recording starts.
   When the tape reaches the end, the VTR automatically rewinds the tape, and the power remains on.

   The information (data screen) appears on the TV screen. Data screen information will not be recorded on the tape.

To turn off the data screen information
Press DATA SCREEN on the Remote Commander.
To display it again, press DATA SCREEN.

Notes on the remaining tape length indicator

- The remaining tape length shows the approximate length of tape left.
- When you insert a short tape such as E-30 or non-standard commercially available tape, the remaining tape length indicator may not function correctly.

To stop recording
Press ■ STOP.

Note on the INDEX indicator
When you start recording from the stop mode, INDEX lights in the display window for a moment. This means that an index signal is being recorded on the tape.
You can later locate the beginning of the recording by searching for the index signal. See "Locating the Beginning of Recordings" on page 27.

Resetting the tape counter

The tape counter in the display window helps you to locate a certain scene after recording. Press COUNTER RESET on the Remote Commander to set the counter to the "0H00M00S" (counter zero) position before recording the tape (the tape counter is automatically reset to zero whenever a cassette is loaded). The VTR will keep counting the length of the tape being recorded.

Note
If the display window shows the current clock, not the tape counter, press CLOCK/COUNTER on the Remote Commander to switch the display to the tape counter.

To record a program without watching the TV
Turn off the power of the TV or color monitor.
Recording continues.

Watching a TV program While Recording Another

Select the program you want to watch on the TV.

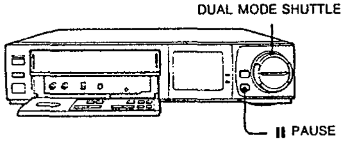
If you use a color monitor
You cannot watch another program during recording unless the monitor has an internal TV tuner.

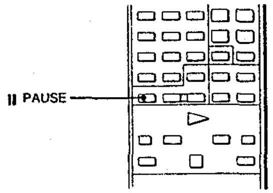
Maximum Recording Time of a Tape

Recording in the SP or LP mode is possible with this VTR. When recording, select the desired recording mode (SP or LP) with REC MODE.
During playback, the VTR automatically detects the recording format, and then plays back the tape in the appropriate mode.
A tape recorded in the LP mode runs twice as slowly as a tape recorded in the SP mode. Refer to the chart below for the recording/playback time available in each mode.

Cassette tape	Recording/Playback time	
	SP mode	LP mode
E-240	4 hr.	8 hr.
E-180	3 hr	6 hr.
E-120	2 hr.	4 hr.
E-60	1 hr.	2 hr.

Cutting Out Unwanted Scenes





While recording

1. Press II PAUSE when an unwanted scene appears. Recording stops.
2. Press II PAUSE again to resume recording at the desired scene.

By recording over unwanted scene

1. Press II PAUSE when an unwanted scene appears. Recording stops.
2. Turn the DUAL MODE SHUTTLE ring on the VTR to the left and search for the point from which you wish to continue recording.
3. Release the DUAL MODE SHUTTLE ring at the desired point.
   After an instant of still mode, the VTR automatically enters the recording pause mode.
4. Press II PAUSE to resume recording at the desired scene.

Note
When the recording pause mode lasts for more than approximately 5 minutes, the VTR will enter the stop mode.

Timer-Activated Recording

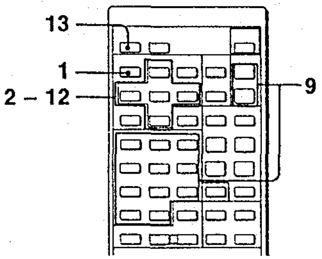
You can preset up to eight TV programs within one month (between today and one day before the same day in the next month).
This section shows you how to preset, on the timer of the VTR, the recording turn-on and turn-off time for the TV programs to be recorded. You can also check and change the timer settings if you want.

Setting the Timer

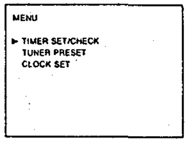
Set the timer using the buttons on the Remote Commander while referring to the display on the TV screen.

Check the followings before setting the timer:
- You have turned on the TV and selected the program position for video playback, if your TV is connected only to the AERIAL OUT of the VTR.
- You have turned on the TV and selected the video input on the TV or the color monitor, if your TV (color monitor) is connected to both AERIAL OUT and LINE OUT of the VTR.
- The date and clock are set correctly. (See "Setting Date and Clock" on page 8.)
- The cassette loaded has a safety tab.
  If you load a cassette without safety tab and press TIMER REC (ON/OFF), the cassette will automatically be ejected.
- The cassette tape is long enough to record all the programs.

Example:
Suppose you want to record a program broadcast on program position 26 from 20:00 to 21:55 on Wednesday. 27th November, 1991 in SP mode

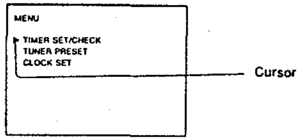


1. Press MENU.



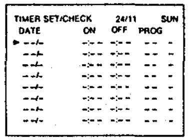
```
MENU
▶ TIMER SET/CHECK
  TUNER PRESET
  CLOCK SET
```

2. Press ▲ or ▼ to move the cursor (▶) to TIMER SET/CHECK.



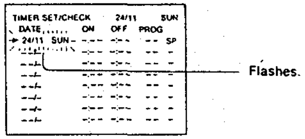
```
MENU
▶ TIMER SET/CHECK
  TUNER PRESET
  CLOCK SET
```

3. Press EXECUTE.
   The TIMER SET/CHECK display appears on the screen.
   When the clock is not set properly, a short beep alerts you. Set the clock correctly. (See "Setting Date and Clock" on page 8.)



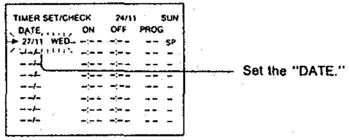
```
TIMER SET/CHECK      24/11    SUN
 DATE         ON     OFF   PROG
▶ --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
```

4. Press ▶.
   Today's date appears and flashes.



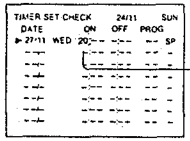
```
TIMER SET/CHECK      24/11    SUN
 DATE         ON     OFF   PROG
▶ 24/11 SUN - -:--   -:--   --  SP
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
```

5. Press ▲ to set the date to "27/11 WED."
   The day of the week is automatically set.



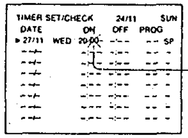
```
TIMER SET/CHECK      24/11    SUN
 DATE         ON     OFF   PROG
▶ 27/11 WED - -:--   -:--   --  SP
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
  --/-        -:--   -:--   --   -
```

6. Press ▶ to make the hour section under "ON" flash and then ▲ or ▼ until "20" appears.



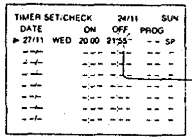
Set the hour of the turn-on time.

7. Press ▶ to make the minute section under "ON" flash and then ▲ or ▼ until "00" appears.



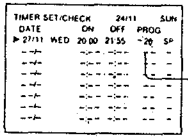
Set the minute of the turn-on time.

8. Press ▶.
The off-time flashes under "OFF."
Set the turn-off time referring to steps 6 and 7.



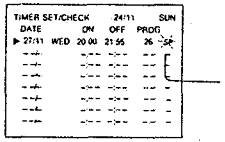
Set the turn-off time.

9. Press ▶ to make the number under "PROG" flash and then ▲ or ▼ until 26 appears.
Only the program positions set in the VTR will appear.
You can also use the PROG +/– (PROGRAM +/–) or program position number buttons. (To select a number over 9, press -/--, and then the 2-digit number desired.)



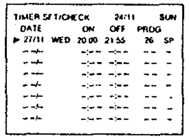
Set the program position

10. Press ▶ to make the recording speed (SP or LP) flash and then ▲ or ▼ so that SP appears.
REC MODE can also be used.



Set the recording speed.

11. Press ▶.
All of the settings stop flashing, indicating that the setting has been completed.



If you have other programs to be set
Move the cursor to the next line using ▼, and repeat steps 4 to 11

12. Press EXECUTE.
All the settings are stored into the VTR.

13. Press TIMER REC (ON/OFF).
The VTR now stands by for the timer-activated recording, and the TIMER indicator appears in the display window.
If no cassette has been loaded, or the tape is at its end, the TIMER indicator will not appear.

The VTR automatically turns on, starts recording at the selected time, and turns off after recording ends.

To correct the setting halfway before pressing EXECUTE
Press ◀ to return to the item to be changed.

To record video sources from LINE IN 1 or 2 jacks
Press INPUT SELECT in step 9 to call up LINE 1 or LINE 2 under the "PROG" position. The indication will return to program position numbers on the third press.

To stop timer-activated recording
Press TIMER REC (ON/OFF).

Buttons which can be operated during timer-activated recording

- TIMER REC (ON/OFF)
  (To stop recording)
- COUNTER RESET
  (See "Resetting the tape counter", page 17.)
- DATA SCREEN
  (Press to display or turn off the data screen.)
- MENU
  (Press to check the timer settings. See "Checking the Timer Settings", page 22.)

To use the VTR before timer recording starts

Press TIMER REC (ON/OFF), then turn on the power of the VTR.
After using the VTR, be sure to press TIMER REC (ON/OFF) again.

If power interruption occurs

- If a power interruption lasting less than approximately one hour occurs while the VTR is in the recording standby mode, the VTR will re-enter the timer-activated recording standby mode.
- If a power interruption lasting more than approximately one hour occurs while the VTR is in the recording standby mode, timer settings are erased. Reset the settings from the beginning.
- If a power interruption lasting less than approximately one hour occurs during a timer recording, the VTR will start recording again and the tape counter will be reset to zero.

Daily/weekly recording

You can preset to record the same program each day of the week (daily recording) or the same program on a specific day of every week (weekly recording).

1. Follow steps 1 to 3 in "Setting the Timer" (page 19).

2. Press ▶.
The "DATE" position flashes.

3. Press ▲ or ▼ until your desired indication appears.
Pressing ▲ changes the indication in the following order.
Pressing ▼ changes the indication in the reversed order.

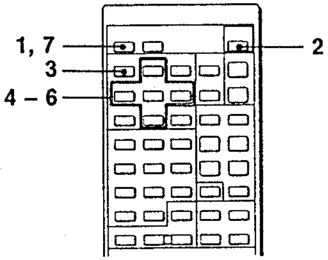
Example: If today is 27th November

Indication	Setting
27/11 WED	On 27th November
↓	↓
28/11 THU	On 28th November
:	:
:	:
:	:
↓	↓
26/12 THU	1 month later
↓	↓
EVERY SUN	Every Sunday
↓	↓
EVERY MON	Every Monday
:	:
:	:
:	:
↓	↓
EVERY SAT	Every Saturday
↓	↓
MON-FRI	Every day except Saturday and Sunday
↓	↓
MON-SAT	Every day except Sunday
↓	↓
SUN-SAT	Every day

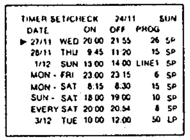
4. Follow steps 6 to 13 in "Setting the Timer" (page 20).

Checking the Timer Settings

You can display all of the timer settings you have made on the TV screen to check the settings.



1. Press TIMER REC (ON/OFF) to turn off the TIMER indicator in the display window.
2. Press ⏻ to turn on the VTR.
3. Press MENU.
   The main MENU appears on the TV screen.
4. Press ▲ or ▼ to move the cursor (▶) to TIMER SET/CHECK.
5. Press EXECUTE.
   The TIMER SET CHECK display appears.



```
TIMER SET/CHECK       24/11       SUN
 DATE           ON     OFF   PROG
▶ 27/11   WED  20:00  21:55     26  SP
  28/11   THU   9:45  11:20     15  SP
   1/12   SUN  13:00  14:00  LINE1  SP
  MON -   FRI  23:00  23:15      6  SP
  MON -   SAT   8:15   8:30     15  SP
  SUN -   SAT  18:00  19:00     10  SP
  EVERY   SAT  20:00  20:54      8  SP
   3/12   TUE  10:00  12:00     50  LP
```

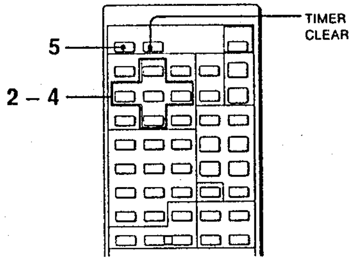
6. Press EXECUTE to return to the original screen.
7. Press TIMER REC (ON/OFF) to return to the timer recording standby mode.

Note on the TIMER SET/CHECK display
When a recording is set for only one day, that setting will be erased from the TIMER SET/CHECK display after the recording is over.

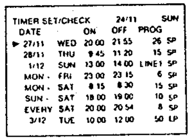
To check the timer settings during timer recording
Follow steps 3 to 6 above.

Changing or Canceling the Timer Settings

You can change or cancel the timer settings by referring to the TIMER SET/CHECK display.

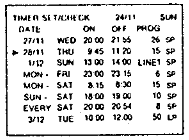


1. Call up the TIMER SET/CHECK display.
   Refer to steps 1 to 5 in "Checking the Timer Settings."



```
TIMER SET/CHECK       24/11       SUN
 DATE           ON     OFF   PROG
▶ 27/11   WED  20:00  21:55     26  SP
  28/11   THU   9:45  11:20     15  SP
   1/12   SUN  13:00  14:00  LINE1  SP
  MON -   FRI  23:00  23:15      6  SP
  MON -   SAT   8:15   8:30     15  SP
  SUN -   SAT  18:00  19:00     10  SP
  EVERY   SAT  20:00  20:54      8  SP
   3/12   TUE  10:00  12:00     50  LP
```

2. Move the cursor to the program you wish to change or cancel.



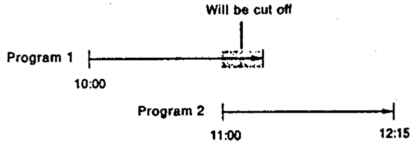
```
TIMER SET/CHECK       24/11       SUN
 DATE           ON     OFF   PROG
  27/11   WED  20:00  21:55     26  SP
▶ 28/11   THU   9:45  11:20     15  SP
   1/12   SUN  13:00  14:00  LINE1  SP
  MON -   FRI  23:00  23:15      6  SP
  MON -   SAT   8:15   8:30     15  SP
  SUN -   SAT  18:00  19:00     10  SP
  EVERY   SAT  20:00  20:54      8  SP
   3/12   TUE  10:00  12:00     50  LP
```

3. To change it, press ◀ or ▶ to make the item to be changed flash, and press ▲ or ▼ to make the required changes.
   To cancel it, press TIMER CLEAR.
4. Press EXECUTE to complete the changes.
   The original screen returns.
5. Press TIMER REC (ON/OFF) to return to the timer recording standby mode.

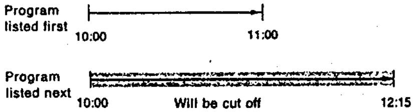
When the timer settings overlap or coincide

According to how the programs overlap, one of the programs will be cut off.

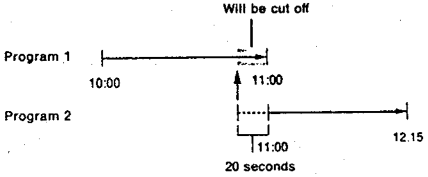
■ If the settings of two programs overlap
The recording of the following program will begin automatically before the preceding program ends as shown.



■ If the turn-on time of two programs are the same
The VTR will record the program listed first on the TIMER SET/CHECK display. The program listed next will not be recorded.



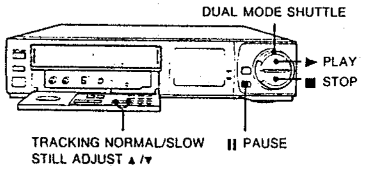
■ If the recording end time of program 1 and the recording start time of program 2 are the same
The last 20 seconds of program 1 will not be recorded because the VTR enters the recording pause mode for program 2 before program 1 ends.

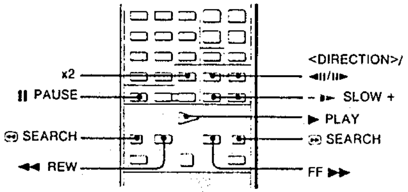


Variable Speed Playback

You can play back the picture at various speeds: still picture; 1/5th times the normal speed; the normal speed; 2 times the normal speed: and a higher speed playback, in both forward and reverse directions. You can enjoy the variable speed playback either by using the buttons on the Remote Commander or the DUAL MODE SHUTTLE ring on the VTR.

Note
When you change the playback speed while playing LP-recorded tapes, the data screen does not appear on the screen. Also, the playback picture becomes black and white.





Still picture
During playback, press II PAUSE.
To resume normal playback, press ▶ PLAY or II PAUSE.
When the pause mode lasts for more than approximately 5 minutes, the VTR automatically re-enters the normal playback mode.

If bands appear on the top or bottom of the screen while in the still mode
Press I▶ SLOW +/– to change to the slow-motion play mode. and adjust the picture with TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼.

If the picture is shaking while in the still mode
Adjust the picture with STILL ADJUST ▲/▼.

Picture search
During playback, keep pressing ◀◀ REW (reverse direction) or FF ▶▶ (forward direction). A high-speed picture without sound appears on the TV screen.
To resume normal playback, release the button at a desired scene

Locked picture search
During playback, press ⊜ SEARCH (reverse direction) or ⊜ SEARCH (forward direction). A high-speed picture appears on the screen even when you release the button.
To resume normal playback, press ▶ PLAY.

Slow-motion picture
During playback or in the still mode, press I▶ SLOW + or –.
Change the slow-motion speed with the + and – buttons. Press + to increase the playback speed, and – to decrease it.

If streaks or noise appear on a slow-motion picture
Adjust the picture with the TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼.

2 times the normal speed picture
During playback or in the still mode, press x2 (forward direction)

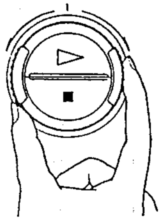
Frame-by-frame picture
In the still mode, press ◀II to reverse the picture one frame.
Press II▶ to advance the picture one frame.
To resume normal playback, press ▶ PLAY.

Watching the picture momentarily during the fast-forward or rewind
During fast-forward, turn the DUAL MODE SHUTTLE ring on the VTR clockwise or press FF ▶▶ on the Remote Commander.
During rewind, turn the DUAL MODE SHUTTLE ring counterclockwise or press ◀◀ REW on the Remote Commander
You can see the high-speed playback picture as long as you hold the ring in that position or while you press the button.
To return to the fast-forward or rewind mode, release the ring or button.

Watching normal, slow and x2 picture playback in reverse direction
During forward playback of the desired mode, press < DIRECTION.
To resume forward playback, press DIRECTION > or ▶ PLAY.

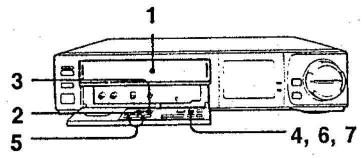
Note on the playback picture
Bands or noise cannot be completely eliminated in the reverse direction playback or in reverse slow modes with TRACKING NORMAL/SLOW and STILL ADJUST ▲/▼.

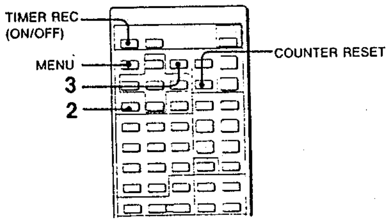
Playing back at various speeds by turning the ring
You can also enjoy the variable speed playback using the DUAL MODE SHUTTLE ring on the VTR.
In any playback mode, turn the DUAL MODE SHUTTLE ring in either the forward or reverse direction as shown.
When you release the ring, normal playback resumes.
(If you turn the ring in the still picture mode, however, releasing the ring makes a still picture. To resume normal playback, press ▶ PLAY.)



Quick-Timer Recording

If you want to start timer-activated recording immediately, use the quick-timer recording function. You can set the recording duration in units of 30 minutes, up to 8 hours. You can also use this function, during recording, to turn off the VTR after the program is over.





If you are recording, perform step 7 only.

1. Insert a cassette with a safety tab on it.
2. Press INPUT SELECT to light TUNER in the display window.
3. Press REC MODE to select the tape speed: SP or LP.
4. Press QUICK TIMER on the VTR. The channel display flashes in the display window. If a cassette with its safety tab removed has been inserted, the VTR ejects the cassette.
5. Press PROGRAM +/– on the VTR to select the program position for recording while the channel display is flashing in the display window.
6. Within one minute after pressing QUICK TIMER in step 4, press QUICK TIMER again to start recording. The REC indicator appears in the display window.
7. Press QUICK TIMER to decide the recording duration. Each press on the button increases the recording duration in units of 30 minutes as shown below:

→ 0:00 → 0:30 → 1:00 → .... → 7:30 → 8:00 ┘

Turn off the TV, and the VTR will continue recording. The recording duration decreases minute by minute until 0:00 appears, and then the VTR turns off automatically.

To stop quick-timer recording
Press TIMER REC (ON/OFF).

To extend the recording duration during recording
Press QUICK TIMER the desired number of times. One press on the button increases the duration by 30 minutes.

If the VTR is in the standby mode for the timer-activated recording
Press TIMER REC (ON/OFF) to turn off the TIMER indicator in the display window, and follow steps 4 to 7.

Buttons on the Remote Commander that can be used during quick- timer recording
- COUNTER RESET resets the counter to zero.
- MENU allows you to check the timer settings. (You cannot change or erase timer settings during the quick-timer recording mode.)

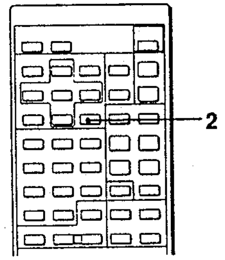
If a power interruption occurs during quick-timer recording
Recording stops and the VTR turns off. If the power interruption lasts less than one hour and power is restored before the recording end time, recording will resume from that instant.

Locating the Beginning of Recordings — INDEX Scan

This VTR records automatically an index signal at the beginning of recording each time you start recording from the stop mode.
You can easily locate the beginning of recordings later by searching for the index signal recorded on the tape.

Note
The index signal is not recorded when you resume recording from the recording pause mode after having pressed ‖ PAUSE during recording.

Searching for the Index Signals



1. Insert a cassette with index signals.
2. Press INDEX once. The INDEX and SCAN indicators flash alternately in the display window.

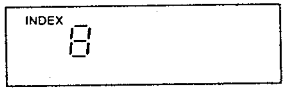
3. To scan the recordings backward, press ◄◄ REW. To scan the recordings forward, press FF ►►. The INDEX and SCAN indicators flash continuously while scanning. The tape is rapidly rewound or advanced to the next index signal position. The tape is played back for approximately 10 seconds from the index signal, and then rewound or advanced rapidly to the next index signal.

Note
While scanning, the tape counter shows the index number

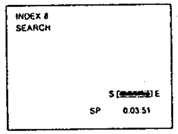
4. When you locate the desired recording, press ► PLAY. Normal playback starts from that point.

When you know the location of the index point
If you know where the index point is located, in terms of how many indexes it is ahead of or behind the current position, the VTR will search for the point automatically. Up to 19 indexes can be searched for.

1. Press INDEX twice.
2. Press INDEX several times to show how many indexes should be counted to reach the desired point.

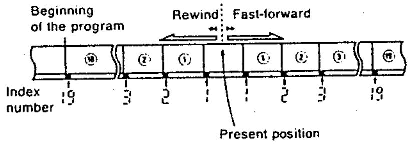


Display window



TV screen

3. Press ◄◄ REW if the index is behind, or FF ►► if the index is ahead of the current position. Playback starts from the searched point.



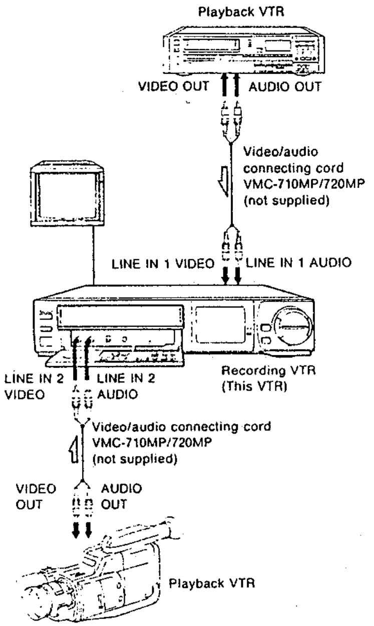
Editing with Another VTR

Using another VTR, you can create your own homemade video programs.

Using this VTR as the Recording VTR

Connection

You can connect another VTR (the playback VTR) to either of the LINE IN 1 VIDEO/AUDIO jacks (at the rear) or the LINE IN 2 VIDEO/AUDIO jacks (on the front panel) of this VTR.


Playback VTR
VIDEO OUT
AUDIO OUT
Video/audio connecting cord VMC-710MP/720MP (not supplied)
LINE IN 1 VIDEO
LINE IN 1 AUDIO
LINE IN 2 VIDEO
LINE IN 2 AUDIO
Recording VTR (This VTR)
Video/audio connecting cord VMC-710MP/720MP (not supplied)
VIDEO OUT
AUDIO OUT
Playback VTR

When the playback VTR is a stereo type
Make connections using the VMC-910MS/920MS connecting cord (not supplied)

When connecting the VTRs
Do not connect both LINE IN and LINE OUT jacks on the two VTRs simultaneously. Doing so may cause a humming noise.

Operation

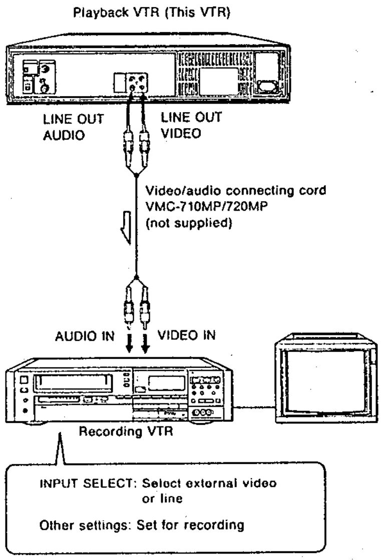
1. Insert a cassette for recording into this VTR (the recording one).
2. Turn on the other VTR (the playback VTR) and insert a source cassette.
3. On this VTR, press REC MODE to select the recording tape speed, SP or LP.
4. On this VTR, press INPUT SELECT to light LINE L1 or LINE L2 to match the jack to which you have connected the other VTR.
5. On the other VTR, search for the playback start point and enter the playback pause mode.
6. On this VTR, search for the recording start point, press the two ● REC buttons on the Remote Commander and then ‖ PAUSE immediately to enter the recording pause mode.
7. Press ‖ PAUSE on this VTR, and then release the pause mode of the other VTR.
   Recording of the signals from the other (playback) VTR starts.

When editing is completed
Press ■ STOP on both of the VTRs.

Using this VTR as the Playback VTR

Connection

You can connect another VTR (the recording VTR) to the LINE OUT VIDEO/AUDIO jacks at the rear of this VTR.


Playback VTR (This VTR)
LINE OUT AUDIO
LINE OUT VIDEO
Video/audio connecting cord VMC-710MP/720MP (not supplied)
AUDIO IN
VIDEO IN
Recording VTR

INPUT SELECT: Select external video or line

Other settings: Set for recording

When the recording VTR is a stereo type
Make connections using the VMC-910MS/920MS connecting cord (not supplied).

When connecting the VTRs
Do not connect both LINE IN and LINE OUT jacks on the two VTRs simultaneously. Doing so may cause a humming noise.

Operation

Note
The recording of video sources based on the NTSC color system cannot be guaranteed.

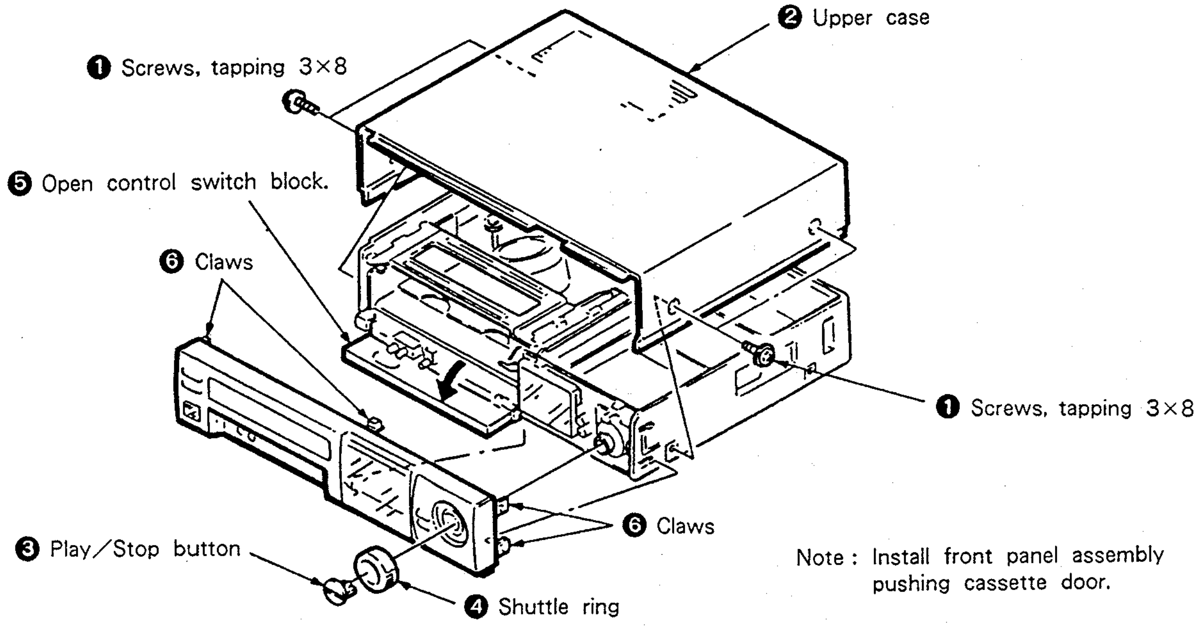
1. Turn on the other VTR (the recording VTR) and insert a cassette for recording.
2. Insert a source cassette into this VTR.

   Note
   If the data screen information is displayed on the TV screen, press DATA SCREEN on the Remote Commander to turn off the information.
3. On this VTR, search for the playback start point and press ‖ PAUSE to enter the playback pause mode.
4. On the other VTR, search for the recording start point and enter the recording pause mode.
5. Release the recording pause mode of the other VTR, and then press ‖ PAUSE on this VTR.
   Recording of the signals from the playback VTR starts.

When editing is completed
Press ■ STOP on both of the VTRs.

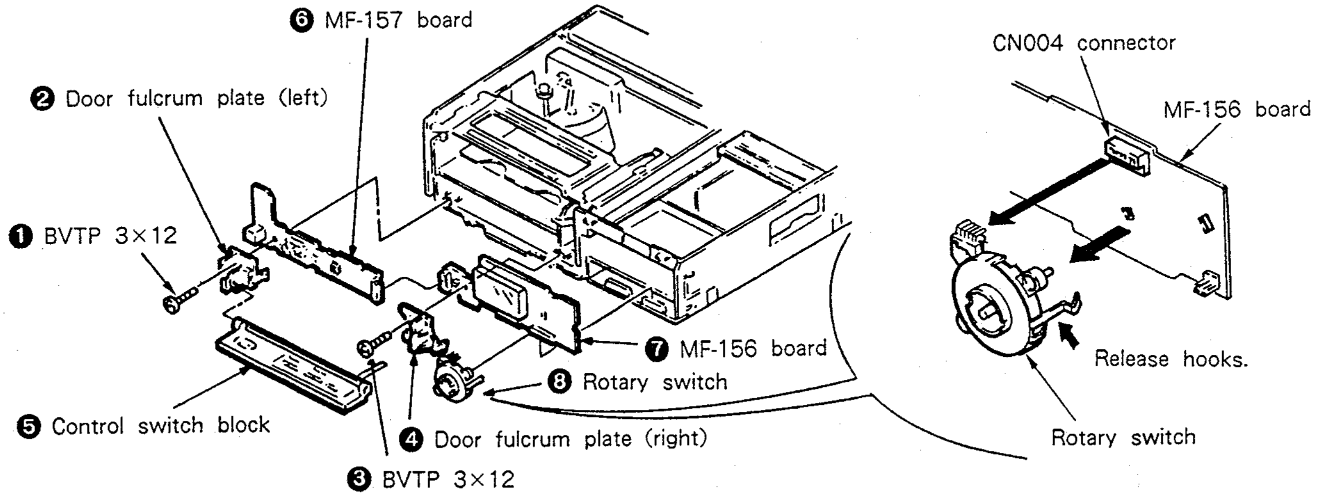
SECTION 2
DISASSEMBLY

2-1. UPPER CASE, FRONT PANEL ASSEMBLY

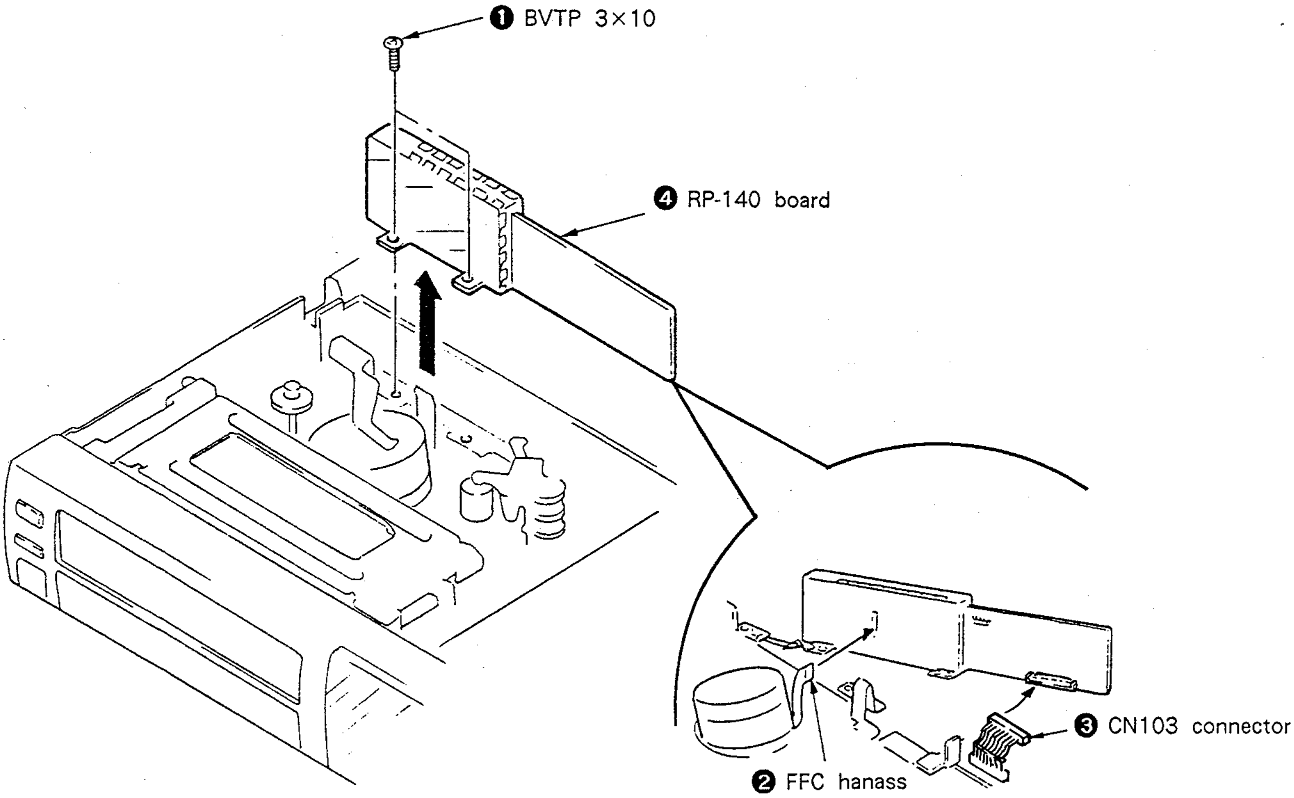

❷ Upper case
❶ Screws, tapping 3×8
❺ Open control switch block.
❻ Claws
❶ Screws, tapping 3×8
❻ Claws
❸ Play／Stop button
❹ Shuttle ring

Note : Install front panel assembly pushing cassette door.

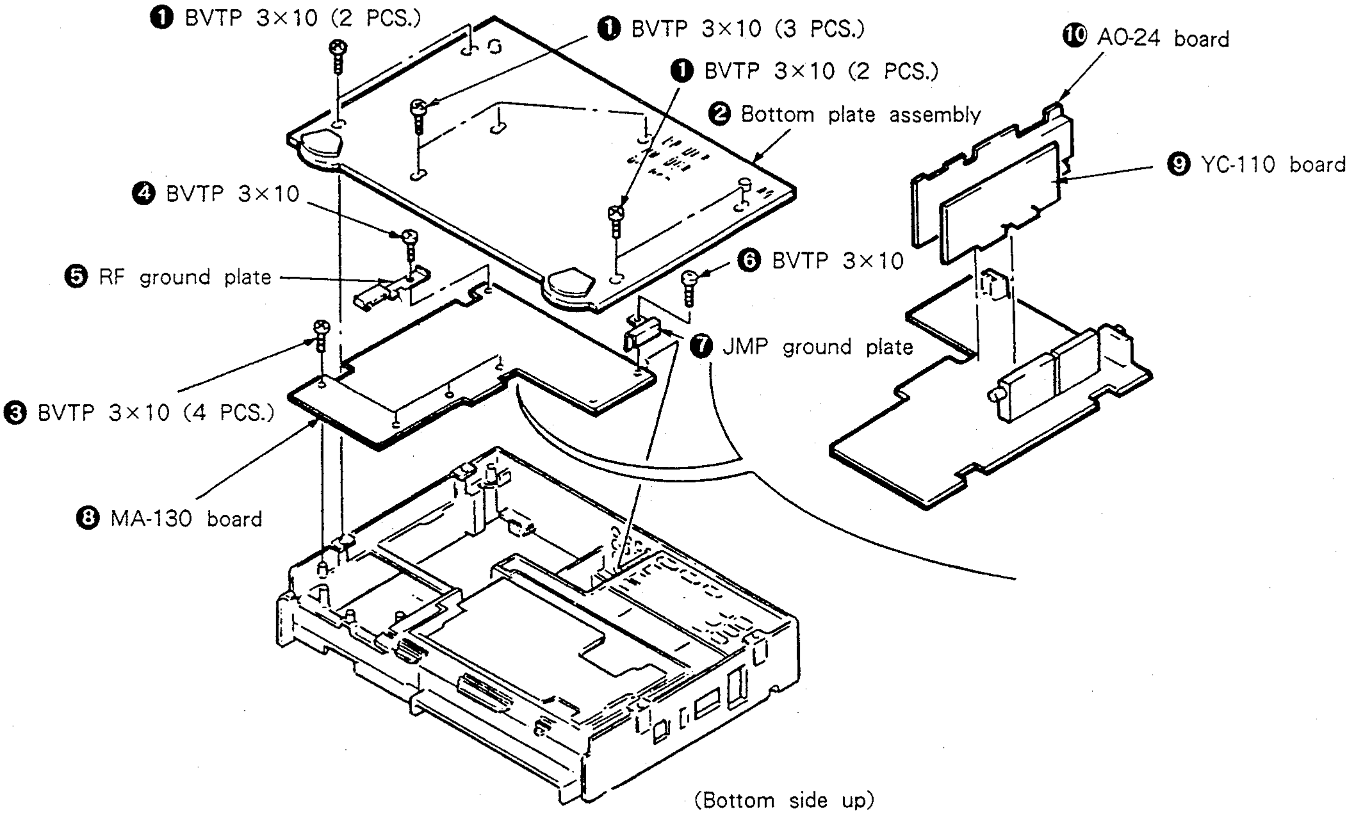
2-2. MF-156 BOARD, MF-157 BOARD, CONTROL SWITCH BLOCK


❻ MF-157 board
❷ Door fulcrum plate (left)
❶ BVTP 3×12
❺ Control switch block
❸ BVTP 3×12
❹ Door fulcrum plate (right)
❼ MF-156 board
❽ Rotary switch
CN004 connector
MF-156 board
Release hooks.
Rotary switch

2-3. RP-140 BOARD

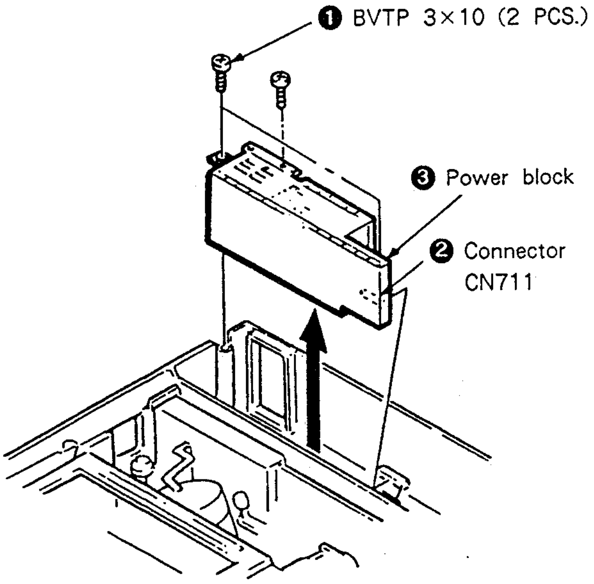

❶ BVTP 3×10
❹ RP-140 board
❸ CN103 connector
❷ FFC hanass

2-4. BOTTOM PLATE, MA-130 BOARD AND YC-110 BOARD

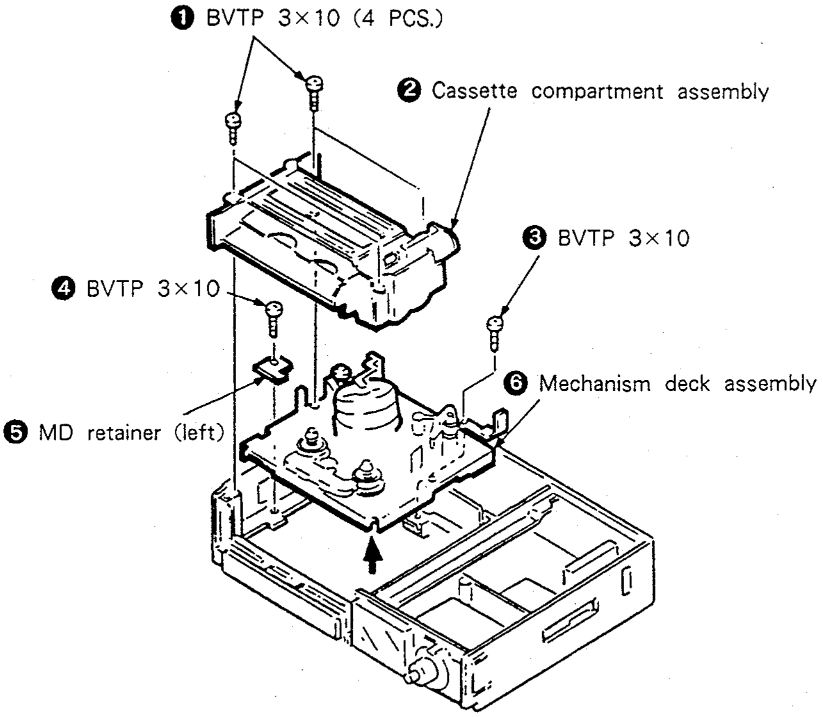

❶ BVTP 3×10 (2 PCS.)
❶ BVTP 3×10 (3 PCS.)
❶ BVTP 3×10 (2 PCS.)
❿ AO-24 board
❷ Bottom plate assembly
❾ YC-110 board
❹ BVTP 3×10
❺ RF ground plate
❻ BVTP 3×10
❼ JMP ground plate
❸ BVTP 3×10 (4 PCS.)
❽ MA-130 board

(Bottom side up)

2-5. POWER BLOCK

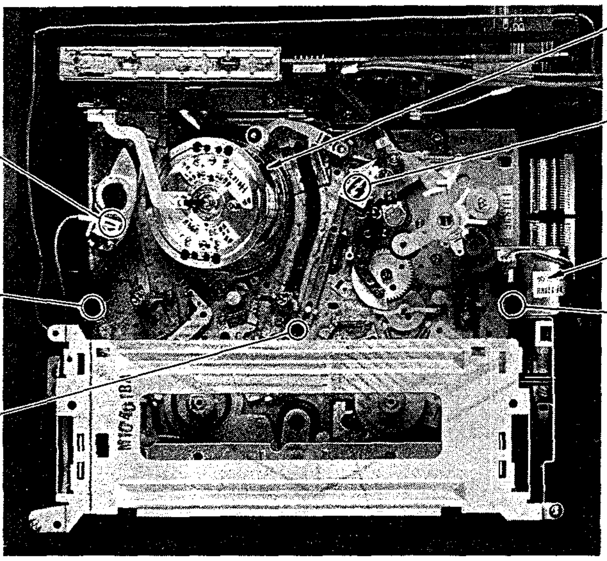

❶ BVTP 3×10 (2 PCS.)
❸ Power block
❷ Connector CN711

2-6. CASSETTE COMPARTMENT ASSEMBLY AND MECHANISM DECK ASSEMBLY


❶ BVTP 3×10 (4 PCS.)
❷ Cassette compartment assembly
❸ BVTP 3×10
❹ BVTP 3×10
❺ MD retainer (left)
❻ Mechanism deck assembly

2-7. INTERNAL VIEWS

– Top Side –


Full erase head
1-543-647-11

Q001
Tape end sensor
8-729-926-31

D001
Tape top/end LED
8-719-985-00

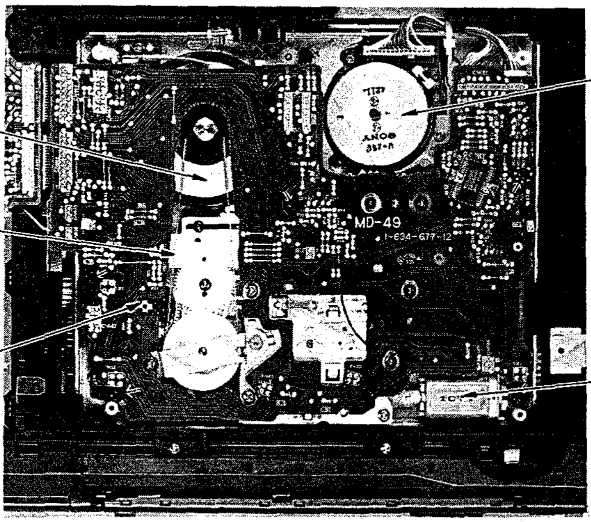
Upper Drum ass'y DZR-25-R
8-848-543-01
Drum ass'y DZH-25A-R
8-848-541-11

ACE head block ass'y
A-6761-135-A

M904
Loading motor
X-3727-784-1

Q002
Tape top sensor
8-729-926-31

– Bottom Side –



M902
Capstan motor (U-26G)
8-835-394-01

Timing belt
3-736-013-01

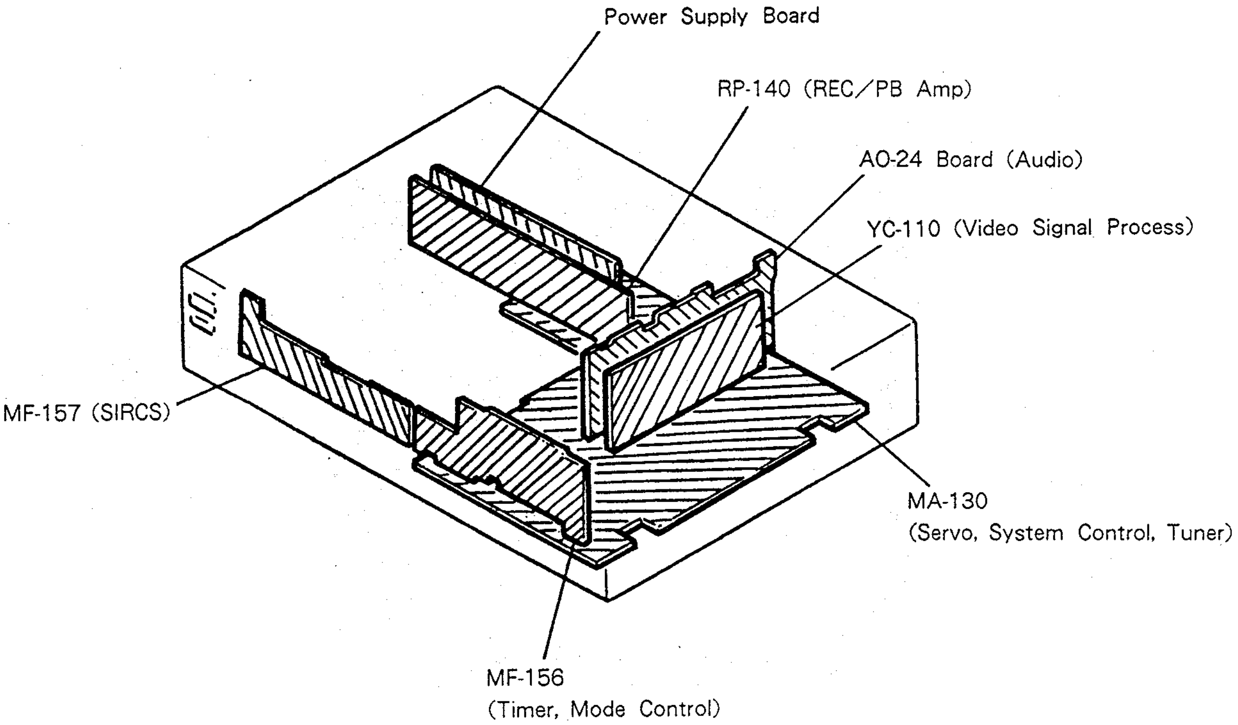
S1
Rotary switch
1-571-920-11

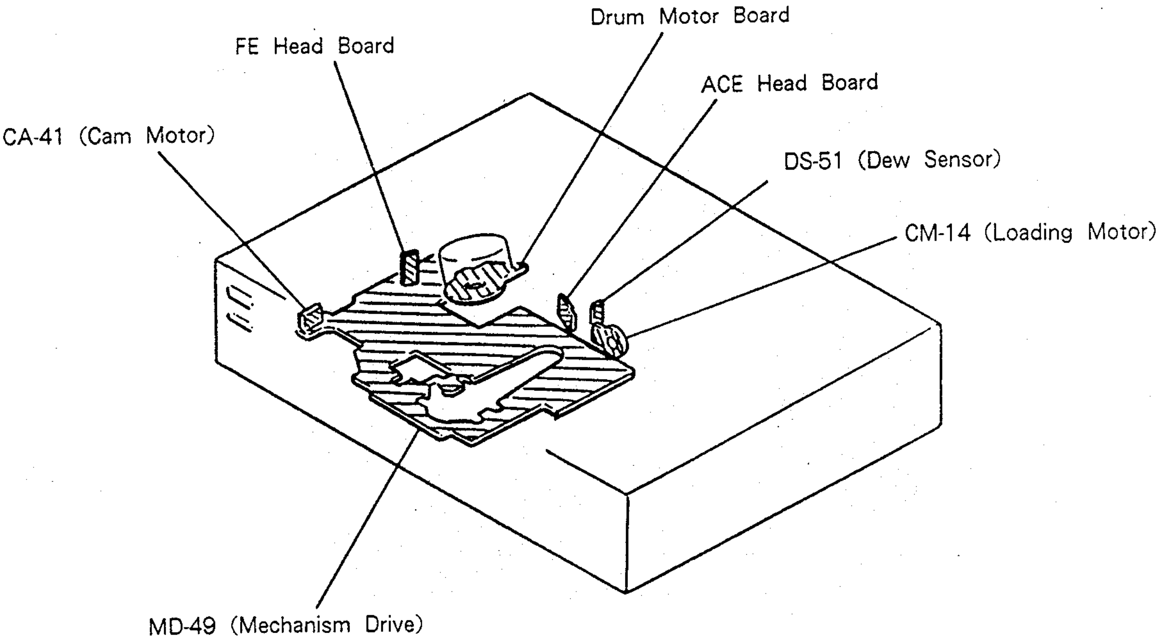
M901
Drum motor

M903
CAM motor ass'y
X-3733-302-1

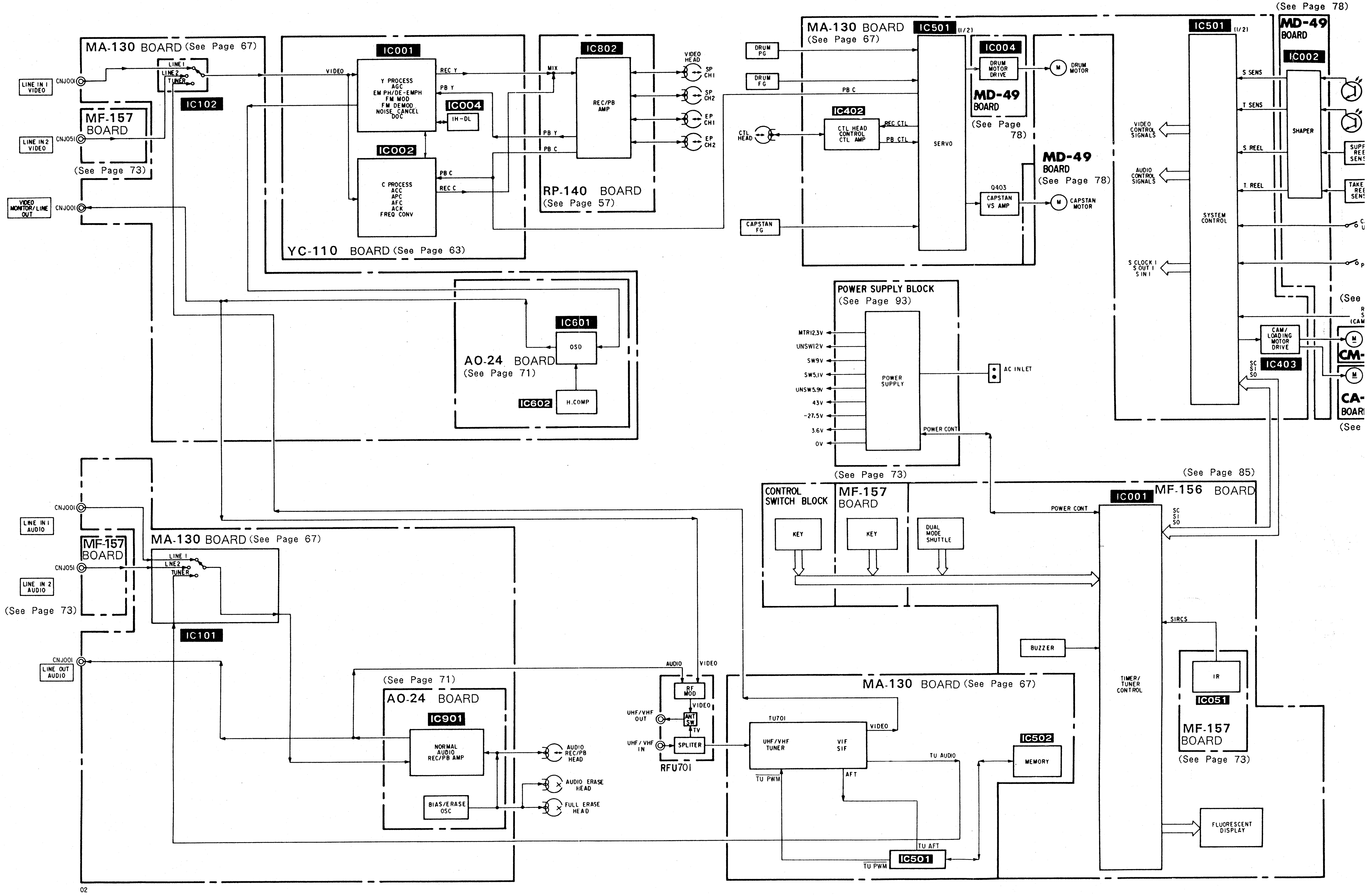
SECTION 3
DIAGRAMS

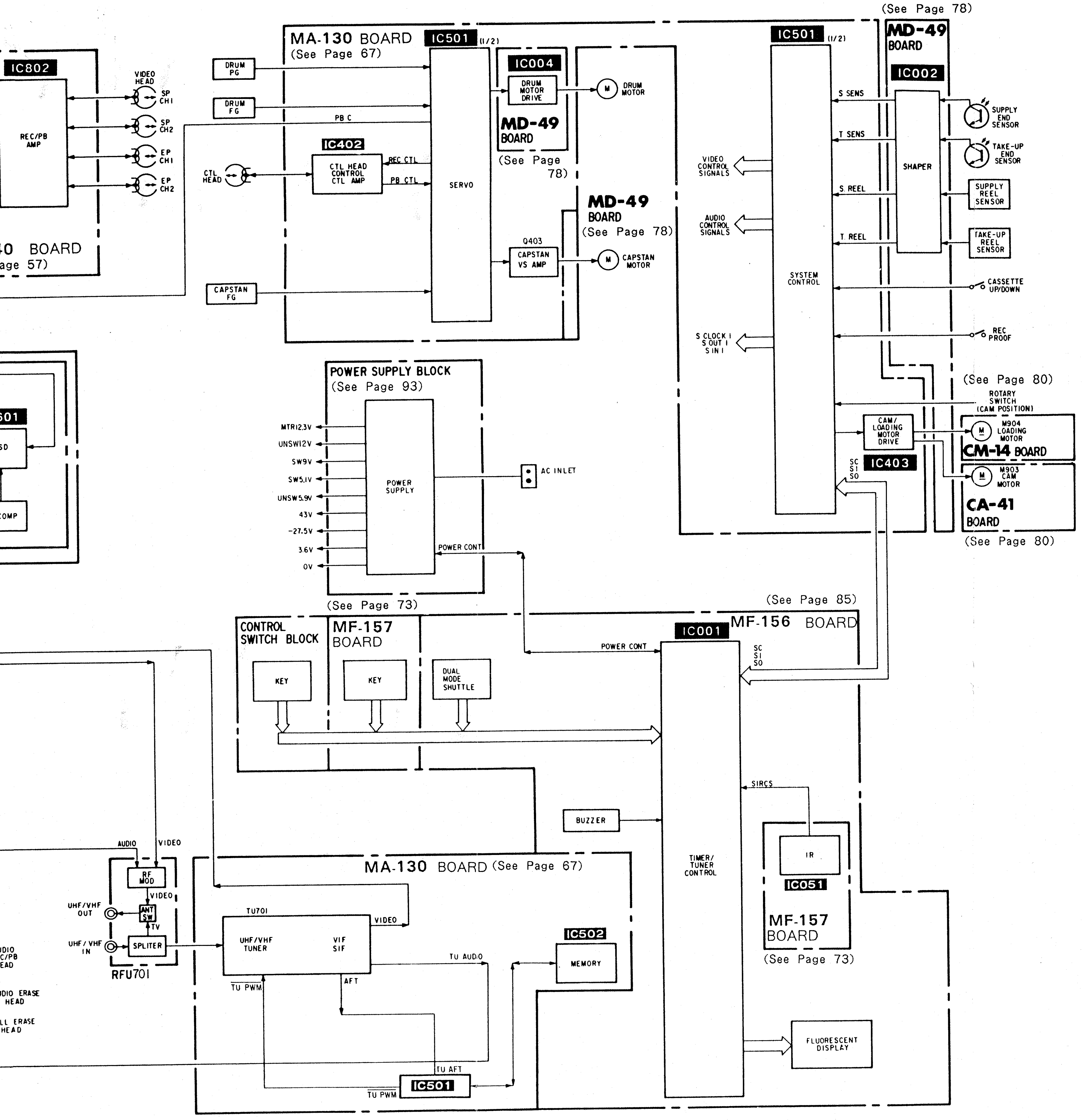
3-1. CIRCUIT BOARDS LOCATION


Power Supply Board
RP-140 (REC/PB Amp)
AO-24 Board (Audio)
YC-110 (Video Signal Process)
MF-157 (SIRCS)
MA-130
(Servo, System Control, Tuner)
MF-156
(Timer, Mode Control)

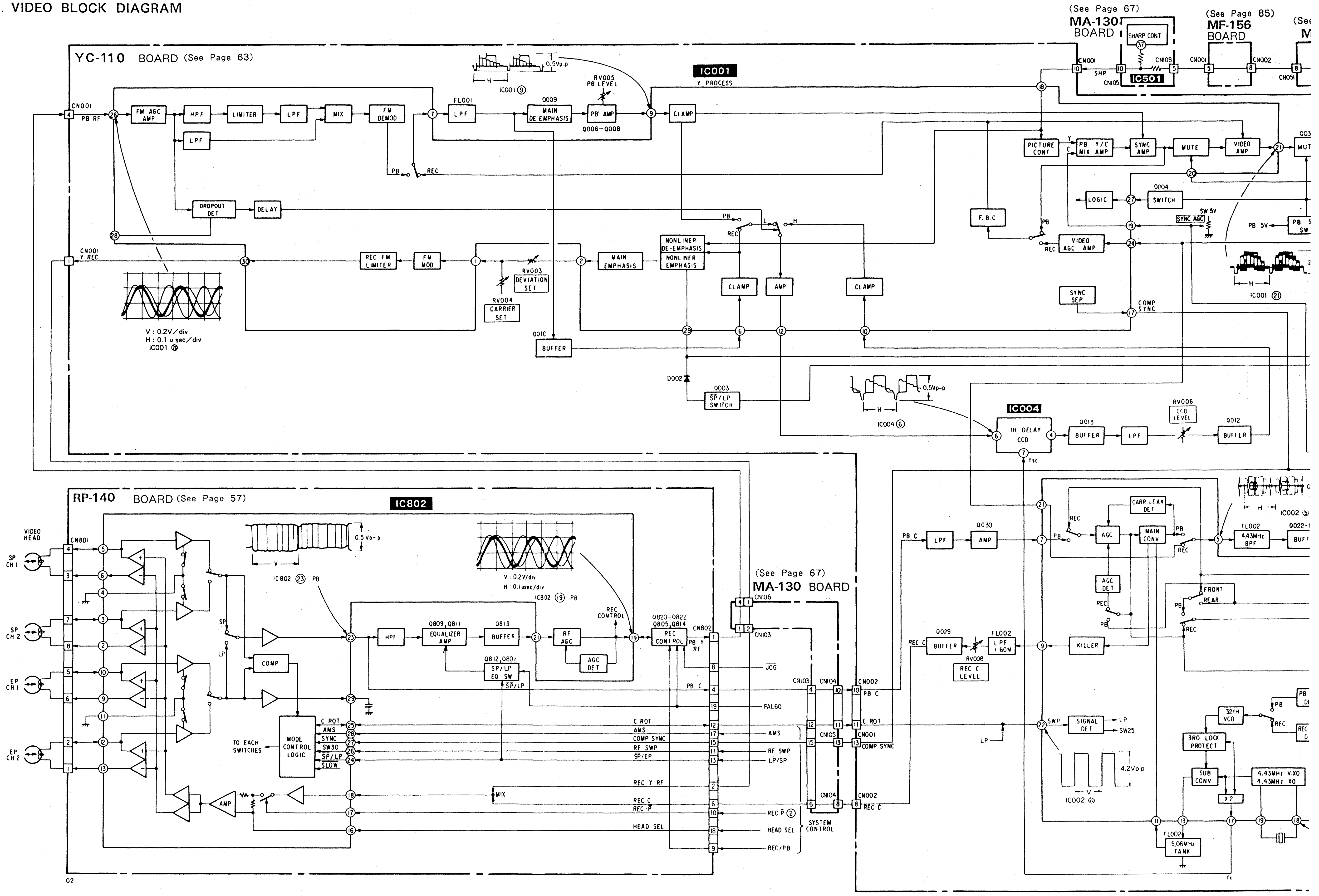

Drum Motor Board
FE Head Board
ACE Head Board
CA-41 (Cam Motor)
DS-51 (Dew Sensor)
CM-14 (Loading Motor)
MD-49 (Mechanism Drive)

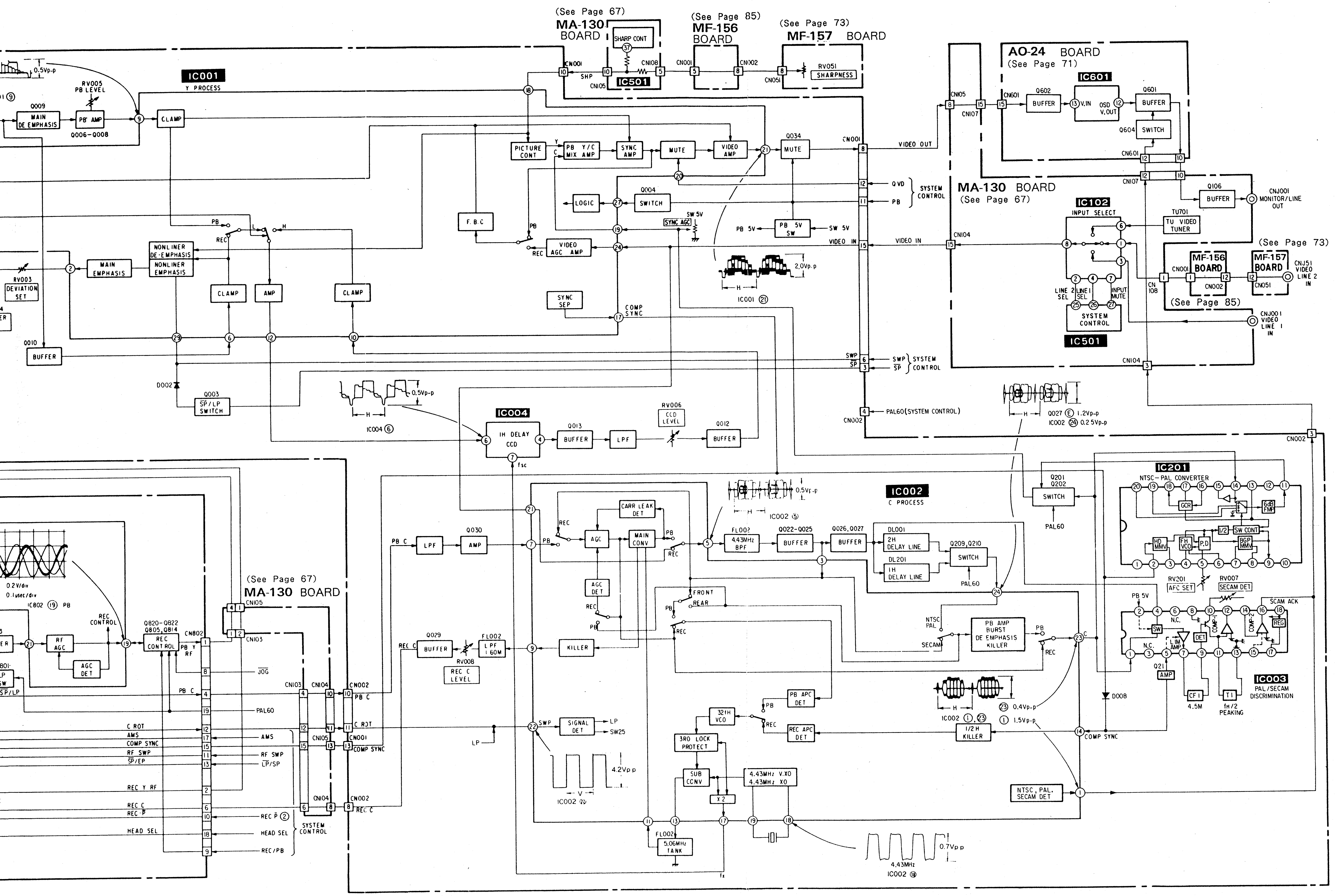
3-2. OVERALL BLOCK DIAGRAM


(See Page 78)
MA-130 BOARD (See Page 67)
LINE IN 1 VIDEO
CNJ001
LINE 1
LINE 2
TUNER
IC102
MF-157 BOARD
LINE IN 2 VIDEO
CNJ051
(See Page 73)
VIDEO MONITOR/LINE OUT
VIDEO
IC001
Y PROCESS
AGC
EMPH/DE-EMPH
FM MOD
FM DEMOD
NOISE CANCEL
DOC
REC Y
PB Y
IC004
1H-DL
IC002
C PROCESS
ACC
APC
AFC
ACK
FREQ CONV
PB C
REC C
YC-110 BOARD (See Page 63)
IC802
MIX
REC/PB AMP
PB Y
PB C
RP-140 BOARD
(See Page 57)
VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
DRUM PG
DRUM FG
CTL HEAD
CAPSTAN FG
MA-130 BOARD
(See Page 67)
IC501 (1/2)
PB C
IC402
CTL HEAD CONTROL CTL AMP
REC CTL
PB CTL
SERVO
IC004
DRUM MOTOR DRIVE
MD-49 BOARD
(See Page 78)
DRUM MOTOR
MD-49 BOARD
(See Page 78)
Q403
CAPSTAN VS AMP
CAPSTAN MOTOR
IC501 (1/2)
VIDEO CONTROL SIGNALS
AUDIO CONTROL SIGNALS
S CLOCK I
S OUT I
S IN I
SYSTEM CONTROL
S SENS
T SENS
S REEL
T REEL
MD-49 BOARD
IC002
SHAPER
SUPP REE SENS
TAKE REE SENS
CAM/LOADING MOTOR DRIVE
IC403
SC
SI
SO
CM-
CA-
BOAR
(See
AO-24 BOARD
(See Page 71)
IC601
OSD
IC602
H.COMP
POWER SUPPLY BLOCK
(See Page 93)
MTR12.3V
UNSW12V
SW9V
SW5.1V
UNSW5.9V
43V
-27.5V
3.6V
0V
POWER SUPPLY
POWER CONT
AC INLET
(See Page 73)
CONTROL SWITCH BLOCK
MF-157 BOARD
KEY
KEY
DUAL MODE SHUTTLE
(See Page 85)
MF-156 BOARD
IC001
POWER CONT
SC
SI
SO
SIRCS
BUZZER
TIMER/TUNER CONTROL
IR
IC051
MF-157 BOARD
(See Page 73)
FLUORESCENT DISPLAY
CNJ001
LINE IN 1 AUDIO
MF-157 BOARD
CNJ051
LINE IN 2 AUDIO
(See Page 73)
MA-130 BOARD (See Page 67)
LINE 1
LINE 2
TUNER
IC101
CNJ001
LINE OUT AUDIO
(See Page 71)
AO-24 BOARD
IC901
NORMAL AUDIO REC/PB AMP
BIAS/ERASE OSC
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO
VIDEO
RF MOD
VIDEO
ANT SW
TV
UHF/VHF OUT
UHF/VHF IN
SPLITER
RFU701
MA-130 BOARD (See Page 67)
TU701
UHF/VHF TUNER
VIF SIF
VIDEO
TU AUDIO
AFT
TU PWM
TU AFT
IC501
TU PWM
IC502
MEMORY
02

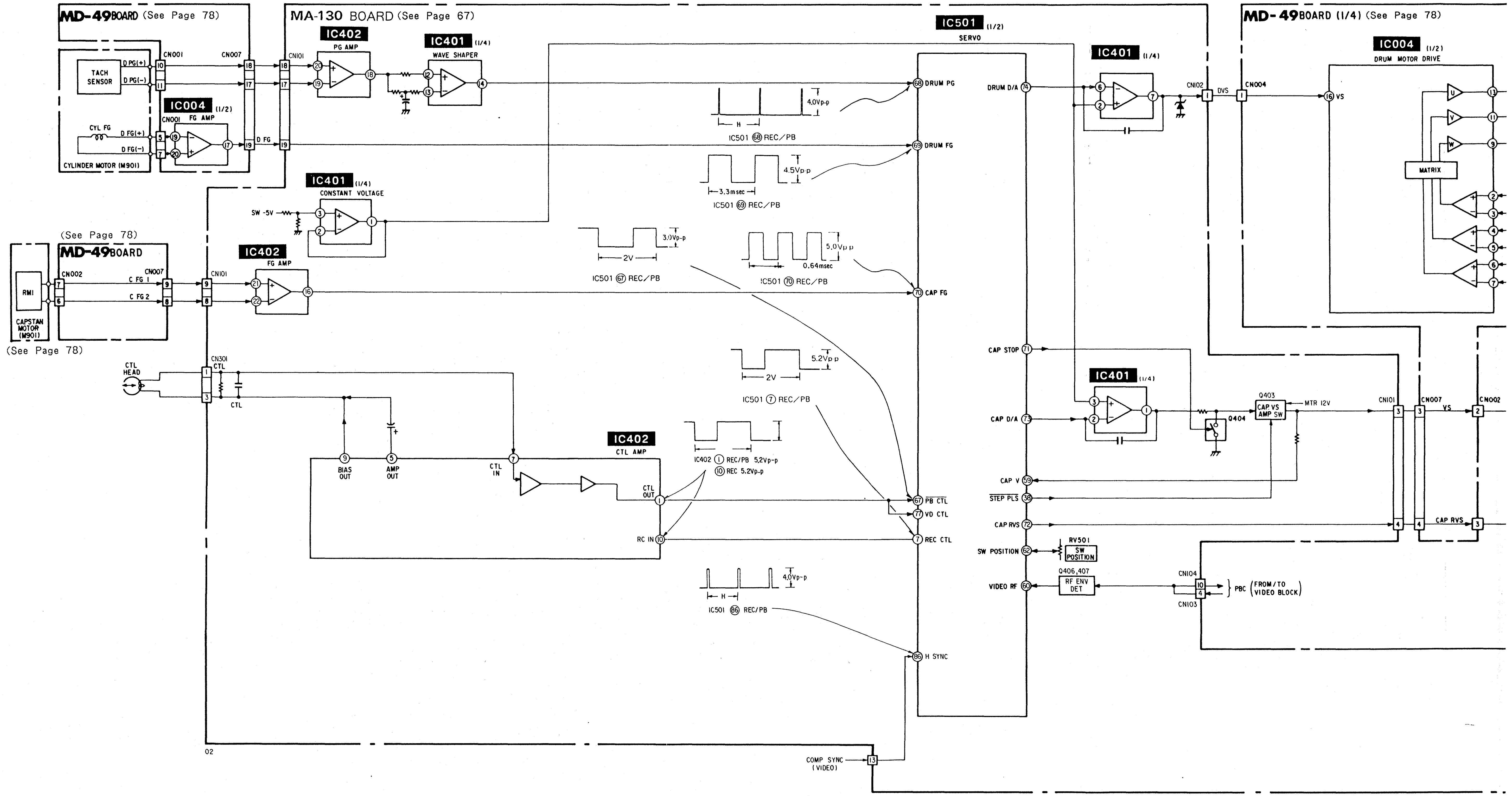

IC802
REC/PB AMP
VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
0 BOARD
age 57)
MA-130 BOARD
(See Page 67)
IC501 (1/2)
DRUM PG
DRUM FG
PB C
IC402
CTL HEAD
CTL HEAD CONTROL CTL AMP
REC CTL
PB CTL
SERVO
CAPSTAN FG
IC004
DRUM MOTOR DRIVE
DRUM MOTOR
MD-49 BOARD
(See Page 78)
Q403
CAPSTAN VS AMP
CAPSTAN MOTOR
MD-49 BOARD
(See Page 78)
IC501 (1/2)
VIDEO CONTROL SIGNALS
AUDIO CONTROL SIGNALS
S CLOCK I
S OUT I
S IN I
SYSTEM CONTROL
S SENS
T SENS
S REEL
T REEL
(See Page 78)
MD-49 BOARD
IC002
SHAPER
SUPPLY END SENSOR
TAKE-UP END SENSOR
SUPPLY REEL SENSOR
TAKE-UP REEL SENSOR
CASSETTE UP/DOWN
REC PROOF
(See Page 80)
ROTARY SWITCH (CAM POSITION)
CAM/LOADING MOTOR DRIVE
IC403
SC
SI
SO
M904 LOADING MOTOR
CM-14 BOARD
M903 CAM MOTOR
CA-41 BOARD
(See Page 80)
501
SD
COMP
POWER SUPPLY BLOCK
(See Page 93)
MTR12.3V
UNSW12V
SW9V
SW5.1V
UNSW5.9V
43V
-27.5V
3.6V
0V
POWER SUPPLY
POWER CONT
AC INLET
(See Page 73)
CONTROL SWITCH BLOCK
KEY
MF-157 BOARD
KEY
DUAL MODE SHUTTLE
(See Page 85)
IC001
MF-156 BOARD
POWER CONT
SC
SI
SO
SIRCS
BUZZER
TIMER/TUNER CONTROL
IR
IC051
MF-157 BOARD
(See Page 73)
FLUORESCENT DISPLAY
AUDIO
VIDEO
RF MOD
VIDEO
UHF/VHF OUT
ANT SW
TV
UHF/VHF IN
SPLITER
RFU701
MA-130 BOARD (See Page 67)
TU701
UHF/VHF TUNER
VIF SIF
VIDEO
TU AUDIO
AFT
TU PWM
IC502
MEMORY
TU AFT
IC501
TU PWM
DIO C/PB EAD
DIO ERASE HEAD
LL ERASE HEAD

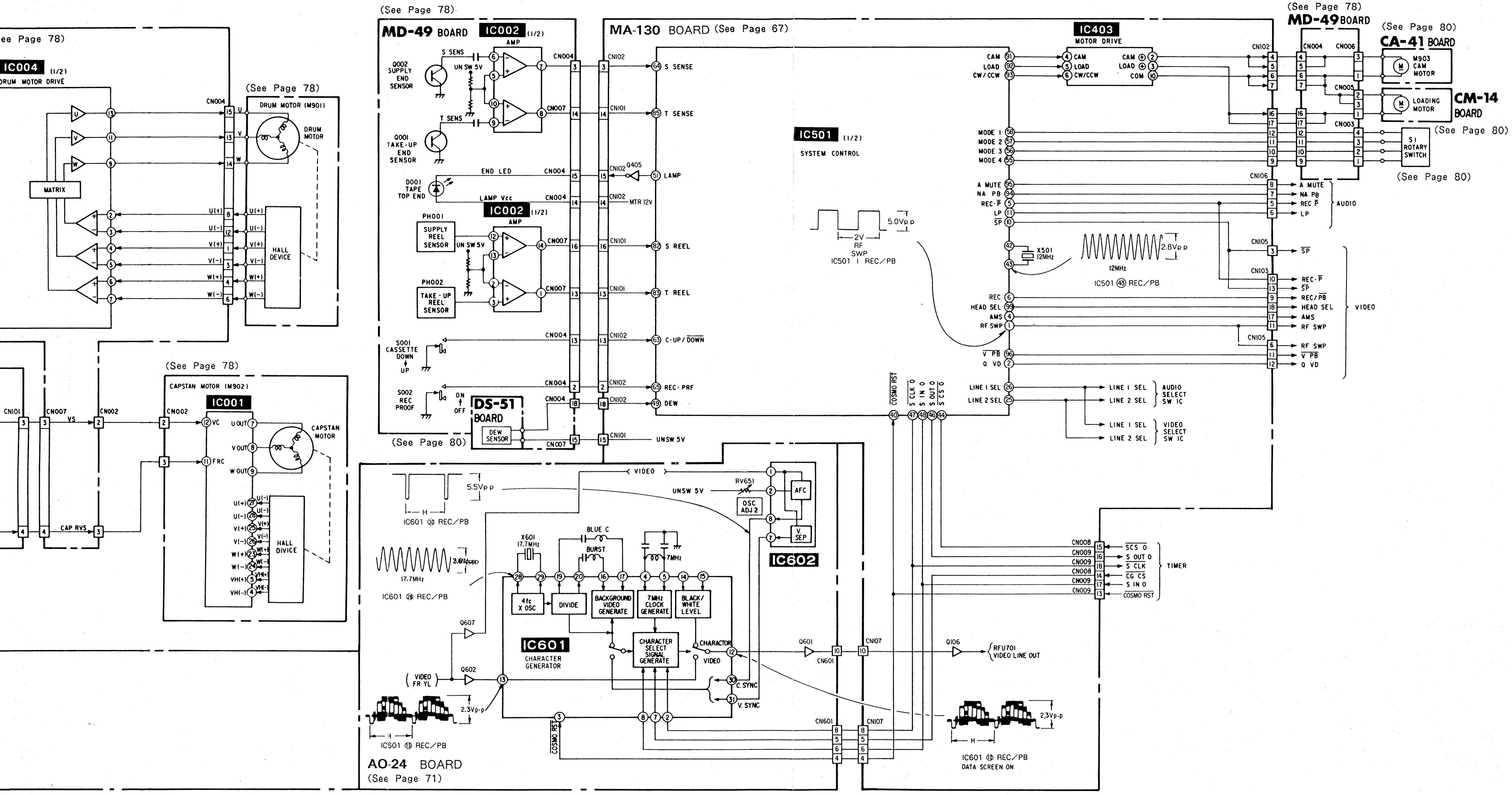
3-3. VIDEO BLOCK DIAGRAM


(See Page 67)
MA-130 BOARD
SHARP CONT
IC501
(See Page 85)
MF-156 BOARD
YC-110 BOARD (See Page 63)
CN001
PB RF
FM AGC AMP
HPF
LIMITER
LPF
MIX
FM DEMOD
FL001
LPF
Q009
MAIN DE EMPHASIS
RV005
PB LEVEL
PB AMP
Q006–Q008
IC001
Y PROCESS
CLAMP
0.5Vp-p
IC001 ⑨
DROPOUT DET
DELAY
CN001
Y REC
REC FM LIMITER
FM MOD
RV003
DEVIATION SET
RV004
CARRIER SET
MAIN EMPHASIS
NONLINER DE-EMPHASIS
NONLINER EMPHASIS
CLAMP
AMP
CLAMP
Q010
BUFFER
D002
Q003
SP/LP SWITCH
V : 0.2V/div
H : 0.1 μ sec/div
IC001 ㉚
IC004
1H DELAY CCD
IC004 ⑥
Q013
BUFFER
LPF
RV006
CCD LEVEL
Q012
BUFFER
fsc
PICTURE CONT
PB Y/C MIX AMP
SYNC AMP
MUTE
VIDEO AMP
Q004
SWITCH
LOGIC
F.B.C
VIDEO AGC AMP
SW 5V
SYNC AGC
PB 5V
SYNC SEP
COMP SYNC
IC001 ㉑
RP-140 BOARD (See Page 57)
IC802
VIDEO HEAD
CN801
SP CH 1
SP CH 2
EP CH 1
EP CH 2
0.5Vp-p
IC802 ㉓ PB
V : 0.2V/div
H : 0.1μsec/div
IC802 ⑲ PB
COMP
HPF
Q809, Q811
EQUALIZER AMP
Q813
BUFFER
RF AGC
AGC DET
Q812, Q801
SP/LP EQ SW
SP/LP
REC CONTROL
Q820–Q822
Q805, Q814
REC CONTROL
CN802
PB Y RF
TO EACH SWITCHES
MODE CONTROL LOGIC
C ROT
AMS
SYNC
SW30
SP/LP
SLOW
AMP
MIX
C ROT
AMS
COMP SYNC
RF SWP
SP/EP
REC Y RF
REC C
REC P
HEAD SEL
JOG
PB C
PAL60
AMS
RF SWP
LP/SP
REC P ②
HEAD SEL
REC/PB
SYSTEM CONTROL
(See Page 67)
MA-130 BOARD
CN105
CN103
CN104
CN105
CN104
CN002
PB C
C ROT
CN001
COMP SYNC
CN002
REC C
PB C
LPF
Q030
AMP
REC C
Q029
BUFFER
RV008
REC C LEVEL
FL002
LPF 1.60M
CARR LEAK DET
AGC
MAIN CONV
AGC DET
FRONT
REAR
KILLER
IC002 ⑤
FL002
4.43MHz BPF
Q022
BUFF
SWP
SIGNAL DET
LP
SW25
4.2Vp-p
IC002 ㉒
32fH VCO
3RD LOCK PROTECT
SUB CONV
4.43MHz V.XO
4.43MHz XO
X2
FL002
5.06MHz TANK
02


(See Page 67)
MA-130 BOARD
SHARP CONT
IC501
(See Page 85)
MF-156 BOARD
(See Page 73)
MF-157 BOARD
RV051 SHARPNESS
AO-24 BOARD
(See Page 71)
IC601
Q602 BUFFER
V.IN OSD V.OUT
Q601 BUFFER
Q604 SWITCH
IC001
Y PROCESS
RV005 PB LEVEL
Q009 MAIN DE EMPHASIS
PB AMP
Q006-Q008
CLAMP
PICTURE CONT
PB Y/C MIX AMP
SYNC AMP
MUTE
VIDEO AMP
Q034 MUTE
VIDEO OUT
QVD
PB
SYSTEM CONTROL
MA-130 BOARD
(See Page 67)
IC102
INPUT SELECT
Q106 BUFFER
CNJ001 MONITOR/LINE OUT
TU701 TU VIDEO TUNER
LOGIC
Q004 SWITCH
F.B.C
VIDEO AGC AMP
SW 5V
SYNC AGC
PB 5V SW
VIDEO IN
2.0Vp-p
IC001 ㉑
NONLINER DE-EMPHASIS
NONLINER EMPHASIS
MAIN EMPHASIS
RV003 DEVIATION SET
CLAMP
AMP
CLAMP
SYNC SEP
COMP SYNC
LINE 2 SEL
LINE 1 SEL
INPUT MUTE
SYSTEM CONTROL
IC501
MF-156 BOARD
MF-157 BOARD
(See Page 73)
(See Page 85)
CNJ51 VIDEO LINE 2 IN
CNJ001 VIDEO LINE 1 IN
Q010 BUFFER
SWP
SP
SYSTEM CONTROL
D002
Q003 SP/LP SWITCH
0.5Vp-p
IC004 ⑥
IC004
1H DELAY CCD
fsc
Q013 BUFFER
LPF
RV006 CCD LEVEL
Q012 BUFFER
PAL60 (SYSTEM CONTROL)
Q027 Ⓔ 1.2Vp-p
IC002 ㉔ 0.25Vp-p
IC201
NTSC-PAL CONVERTER
Q201 Q202 SWITCH
PAL60
GCR
HD MMV
FH VCO
P.D
1/2
SW CONT
BGP MMV
6dB FMP
0.5Vp-p
IC002 ⑤
IC002
C PROCESS
CARR LEAK DET
AGC
MAIN CONV
FL002 4.43MHz BPF
Q022-Q025 BUFFER
Q026, Q027 BUFFER
DL001 2H DELAY LINE
DL201 1H DELAY LINE
Q209, Q210 SWITCH
PAL60
PB C
LPF
Q030 AMP
AGC DET
FRONT
REAR
NTSC PAL
SECAM
PB AMP BURST DE EMPHASIS KILLER
RV201 AFC SET
RV007 SECAM DET
PB 5V
SCAM ACK
SW
LIM AMP
DET
COMP-1
COMP-2
REG
Q21 AMP
CF1 4.5M
T1 fH/2 PEAKING
IC003
PAL/SECAM DISCRIMINATION
D008
0.2V/div
0.1usec/div
IC802 ⑲ PB
(See Page 67)
MA-130 BOARD
RF AGC
AGC DET
REC CONTROL
Q820-Q822 Q805, Q814 REC CONTROL
JOG
PAL60
C ROT
AMS
COMP SYNC
RF SWP
SP/EP
LP/SP
REC Y RF
REC C
REC P
HEAD SEL
REC/PB
SYSTEM CONTROL
Q029 BUFFER
RV008 REC C LEVEL
FL002 LPF 1.60M
KILLER
SIGNAL DET
LP
SW25
4.2Vp-p
IC002 ㉒
PB APC DET
REC APC DET
32fH VCO
3RD LOCK PROTECT
SUB CONV
4.43MHz V.XO
4.43MHz XO
X2
1/2H KILLER
IC002 ①, ㉓
㉓ 0.4Vp-p
① 1.5Vp-p
COMP SYNC
NTSC, PAL, SECAM DET
FL002 5.06MHz TANK
0.7Vp-p
4.43MHz
IC002 ⑱

3-4. SERVO, SYSTEM CONTROL BLOCK DIAGRAM


MD-49 BOARD (See Page 78)
TACH SENSOR
D PG(+)
D PG(-)
CN001
CN007
CYL FG
D FG(+)
D FG(-)
IC004 (1/2)
FG AMP
CYLINDER MOTOR (M901)
MA-130 BOARD (See Page 67)
CN101
IC402
PG AMP
IC401 (1/4)
WAVE SHAPER
D FG
IC401 (1/4)
CONSTANT VOLTAGE
SW -5V
(See Page 78)
MD-49 BOARD
CN002
CN007
C FG 1
C FG 2
RMI
CAPSTAN MOTOR (M901)
(See Page 78)
IC402
FG AMP
CN301
CTL
CTL HEAD
CTL
IC402
CTL AMP
BIAS OUT
AMP OUT
CTL IN
CTL OUT
RC IN
IC501 (1/2)
SERVO
4.0Vp-p
H
IC501 ⑱ REC/PB
4.5Vp-p
3.3msec
IC501 ⑲ REC/PB
3.0Vp-p
2V
IC501 ⑰ REC/PB
5.0Vp-p
0.64msec
IC501 ⑳ REC/PB
5.2Vp-p
2V
IC501 ⑦ REC/PB
IC402 ① REC/PB 5.2Vp-p
⑩ REC 5.2Vp-p
4.0Vp-p
H
IC501 86 REC/PB
DRUM PG
DRUM FG
CAP FG
PB CTL
VD CTL
REC CTL
H SYNC
DRUM D/A
CAP STOP
CAP D/A
CAP V
STEP PLS
CAP RVS
SW POSITION
VIDEO RF
IC401 (1/4)
IC401 (1/4)
CN102
DVS
Q403
CAP VS AMP SW
MTR 12V
Q404
RV501
SW POSITION
Q406,407
RF ENV DET
CN104
CN103
PBC (FROM/TO VIDEO BLOCK)
COMP SYNC (VIDEO)
MD-49 BOARD (1/4) (See Page 78)
CN004
IC004 (1/2)
DRUM MOTOR DRIVE
VS
U
V
W
MATRIX
CN101
CN007
CN002
VS
CAP RVS
02


(See Page 78)
IC004 (1/2)
DRUM MOTOR DRIVE
MATRIX
CN004
(See Page 78)
DRUM MOTOR (M901)
DRUM MOTOR
U
V
W
U(+)
U(-)
V(+)
V(-)
W(+)
W(-)
HALL DEVICE
(See Page 78)
CAPSTAN MOTOR (M902)
IC001
CN101
CN007
CN002
VS
CAP RVS
VC
FRC
U OUT
V OUT
W OUT
CAPSTAN MOTOR
VH(+)
VH(-)
HALL DIVICE
(See Page 78)
MD-49 BOARD
IC002 (1/2)
AMP
S SENS
T SENS
Q002 SUPPLY END SENSOR
Q001 TAKE-UP END SENSOR
UN SW 5V
D001 TAPE TOP END
END LED
LAMP Vcc
IC002 (1/2)
AMP
PH001
SUPPLY REEL SENSOR
PH002
TAKE-UP REEL SENSOR
S001 CASSETTE DOWN UP
S002 REC PROOF
ON OFF
DS-51 BOARD
DEW SENSOR
(See Page 80)
CN004
CN007
MA-130 BOARD (See Page 67)
CN102
CN101
Q405
MTR 12V
S SENSE
T SENSE
LAMP
S REEL
T REEL
C-UP/DOWN
REC·PRF
DEW
UNSW 5V
IC501 (1/2)
SYSTEM CONTROL
5.0Vp-p
2V
RF SWP
IC501 ① REC/PB
X501 12MHz
2.8Vp-p
12MHz
IC501 ㊸ REC/PB
IC403
MOTOR DRIVE
CAM
LOAD
CW/CCW
CAM ⊕
LOAD ⊕
COM
MODE 1
MODE 2
MODE 3
MODE 4
A MUTE
NA PB
REC·P
LP
SP
REC
HEAD SEL
AMS
RF SWP
V PB
Q VD
LINE 1 SEL
LINE 2 SEL
COSMO RST
S CLK O
S IN O
S OUT O
S C S
CN106
CN105
CN103
AUDIO
VIDEO
REC·P
SP
REC/PB
HEAD SEL
AMS
RF SWP
V PB
Q VD
LINE 1 SEL
LINE 2 SEL
AUDIO SELECT SW IC
VIDEO SELECT SW IC
(See Page 78)
MD-49 BOARD
CN004
CN006
CN005
CN003
(See Page 80)
CA-41 BOARD
M903 CAM MOTOR
LOADING MOTOR
CM-14 BOARD
(See Page 80)
S1 ROTARY SWITCH
(See Page 80)
CN008
CN009
SCS O
S OUT O
S CLK
CG CS
S IN O
COSMO RST
TIMER
VIDEO
UNSW 5V
RV651
OSC ADJ 2
AFC
V SEP
IC602
5.5Vp-p
H
IC601 ⑬ REC/PB
X601 17.7MHz
BLUE C
BURST
7MHz
2.6Vp-p
17.7MHz
IC601 ㉘ REC/PB
4fc X OSC
DIVIDE
BACKGROUND VIDEO GENERATE
7MHz CLOCK GENERATE
BLACK/WHITE LEVEL
CHARACTER SELECT SIGNAL GENERATE
CHARACTER
VIDEO
C. SYNC
V. SYNC
IC601
CHARACTER GENERATOR
Q607
Q602
VIDEO FR YL
2.3Vp-p
IC501 ⑬ REC/PB
COSMO RST
Q601
CN601
CN107
Q106
RFU701 VIDEO LINE OUT
2.3Vp-p
IC601 ⑫ REC/PB
DATA SCREEN ON
AO-24 BOARD
(See Page 71)

3-5. SYSTEM CONTROL –VIDEO BLOCK INTERFACE

Signal	Pin. No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB・PAUSE	SLOW	×2	CUE	REVIEW	REC	REC・PAUSE
$\overline{\mathrm{V \cdot PB}}$	MA-130 Board IC501 (96)	O	H	H	H	L	L	L	L	L	L	H	H
HEAD SEL	MA-130 Board IC501 (99)	O	L	L	L	L	H	*1	H	L	L	H	L
RF SW P (SW30)	MA-130 Board IC501 ①	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD/V MUTE	MA-130 Board IC501 ②	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L
AMS	MA-130 Board IC501 ④	O (O. D)	L	L	L	L	L	L	L	*5	*5	L	L
$\overline{\mathrm{SP}}$	MA-130 Board IC501 ⑩	O	*6	*6	*6	*7	*7	*7	*7	*7	*7	*6	*6
EP	MA-130 Board IC501 ⑫	O	L	L	L	*7	*7	*7	*7	*7	*7	*6	*6
LP	MA-130 Board IC501 ⑪	O	*6	*6	*6	*7	*7	*7	*7	*7	*7	L	L
REC・$\overline{\mathrm{P}}$ (RP)	MA-130 Board IC501 ⑤	O	L	L	L	L	L	L	L	L	L	H	L
REC	MA-130 Board IC501 ⑥	O	L	L	L	L	L	L	L	L	L	H	H
V SYNC	MA-130 Board IC501 (66)	I	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8
$\overline{\mathrm{OSD\ MUTE}}$	MA-130 Board IC501 (98)	O (O. D)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9

*1. "H" when tape stops. "L" when tape runs (approx. for 40msec).

*2. Synchronized with drum rotation. 30Hz 50% duty pulse.

*3. Normally "L". "H" when video signal is not generated.

*4. V period "H" pulse.

*5. HI-Z (5V) in SP mode. "L" in LP/EP mode.

*6. Selected by SP/LP. SP mode : "L". LP mode : "H".

*7. Selected by tape recording mode.

Signal \ Mode	SP	LP	EP
$\overline{\mathrm{SP}}$ ⑩	L	H	H
EP ⑫	L	L	H
LP ⑪	L	H	L

*8. Composite sync signal (positive).

*9. "L" when menu screen or blue back screen.

3-6. SYSTEM CONTROL －SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	Pin. No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
REC CTL	MA-130 Board IC501 ⑦	O	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1
CAP STOP	MA-130 Board IC501 (71)	O	H	L	L	L	L	L	H	H	L	L	L	L	L
$\overline{\text{STEP PLS}}$	MA-130 Board IC501 ㊳	O (O. D)	H	H	H	H	H	H	H	＊2	H	H	H	H	H
CAP V ＊3	MA-130 Board IC501 (59)	I													
SW POSITION ＊4	MA-130 Board IC501 (62)	I													
PB CTL	MA-130 Board IC501 (67)	I	H	＊6	＊6			＊1	H/L	＊2	＊6	＊6	＊6	＊1	H
VD CTL	MA-130 Board IC501 (77)	I	H	＊6	＊6			＊1	H/L	＊2	＊6	＊6	＊6	＊1	H
DRUM PG	MA-130 Board IC501 (68)	I	L	＊7	＊7	＊5	＊5	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7
DRUM FG	MA-130 Board IC501 (69)	I	L	＊8	＊8	＊5	＊5	＊8	＊8	＊8	＊8	＊8	＊8	＊8	＊8
CAP FG	MA-130 Board IC501 (70)	I	H/L	＊6	＊6	＊5	＊5	＊6	H/L	＊9	＊6	＊6	＊6	＊6	H/L
CAP RVS	MA-130 Board IC501 (72)	O	H/L	L	H	L	H	L	L	＊2	L	L	H	L	L
CAP DA ＊13	MA-130 Board IC501 (73)	O	＊10	＊10	＊10	＊10	＊10	＊11	＊10	＊10	＊11	＊11	＊11	＊11	＊10
DRUM DA ＊13	MA-130 Board IC501 (74)	O	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12	＊12
REC • $\overline{\text{P}}$ (RP)	MA-130 Board IC501 ⑤	O	L	L	L	L	L	L	L	L	L	L	L	H	L
STEP DRIVE	MA-130 Board IC501 (76)	O	L	L	L	L	L	L	L	＊14	L	L	L	L	L

＊1. 30Hz pulse
＊2. Pulse at tape running
＊3. Input terminal for capstan constant voltage drive
Used when FF/REW, cassette loading/unloading, etc.
＊4. Input terminal for video switching position adjustment.
＊5. Unstable period pulse
＊6. Pulse of period in proportion to tape speed
＊7. 30Hz "H" pulse
＊8. 360Hz pulse
＊9. Pulse at tape running
＊10. Approx. 2msec period "H" or "L" pulse
＊11. Approx. 1.5msec period "H" or "L" pulse
＊12. Approx. 3msec period "H" or "L" pulse
＊13. 3 value output of "H", "L" and HI-Z (2.5V)
＊14. "H" when FWD direction and STEP drive

3-7. SYSTEM CONTROL －MECHANISM BLOCK INTERFACE

Signal	Pin. No.	I/O	HI-SPEED REW	EJECTED	CASSETTE LOADING	CASSETTE UNLOAD-ING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB・PAUSE	SLOW	×2	CUE	REVIEW	REC	REC・PAUSE
CAM ＊1	MA-130 Board IC501 (91)	O	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L
LOAD	MA-130 Board IC501 (92)	O	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
CW/$\overline{\text{CCW}}$	MA-130 Board IC501 (93)	O			H	L	H	L											
MODE 1	MA-130 Board IC501 (58)	I	H	L	L	L	H	H	L	H	H	H	L	L	H	H	H	H	L
MODE 2	MA-130 Board IC501 (57)	I	L	H	H	H	H	H	L	L	L	L	H	H	L	L	L	L	H
MODE 3	MA-130 Board IC501 (56)	I	H	H	H	H	L	L	L	L	L	H	H	H	H	H	L	H	H
MODE 4	MA-130 Board IC501 (55)	I	H	H	H	H	H	H	L	H	H	L	L	L	L	L	L	L	L
REC PRF	MA-130 Board IC501 (65)	I	＊2	L	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2
C-UP/$\overline{\text{DOWN}}$	MA-130 Board IC501 (63)	I	L	H	H→L	L→H	L	L	L	L	L	L	L	L	L	L	L	L	L
T REEL	MA-130 Board IC501 (83)	I	＊3	H/L	H/L	H/L	H/L	H/L	H/L	＊3	＊3	＊3	H/L	＊3	＊3	＊3	＊3	＊3	H/L
S REEL	MA-130 Board IC501 (82)	I	＊3	H/L	H/L	H/L	＊3	＊3	H/L	＊3	＊3	＊3	H/L	＊3	＊3	＊3	＊3	＊3	H/L
LAMP	MA-130 Board IC501 (51)	O	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4
DEW	MA-130 Board IC501 ㊾	I	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5	＊5
CAP V	MA-130 Board IC501 (59)	I	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6
CAP STOP	MA-130 Board IC501 (71)	O	L	H	H	H	L	L	H	L	L	L	H	H	L	L	L	L	H
CAP RVS	MA-130 Board IC501 (72)	O	H	H			L	H	H/L	L	H	L	L	L/＊9	L	L	H	L	L
CAP DA ＊8	MA-130 Board IC501 (73)	O																	
T SENS	MA-130 Board IC501 (85)	I	＊7	＊4	＊4	＊4	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7
S SENS	MA-130 Board IC501 (64)	I	＊7	＊4	＊4	＊4	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7

＊1. "H" when mechanism mode transition
＊2. "L" when erasing protection tab is bent. "H" when not bent.
＊3. Pulse of period in proportion to reel rotating speed
＊4. Approx. 2msec period "H" pulse
＊5. Nomally "H"
＊6. Input terminal for capstan constant voltage drive.
Used in FF/REW, cassette loading/unloading, etc.
＊7. Nomally "L", 2msec period "H" pulse when tape top or tape end is detected.
＊8. 3 value output of "H", "L" and "HIZ (2.5V)"
＊9. Pulse at tape running

3-8. SYSTEM CONTROL －SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE

Signal	Pin. No.	I/O	I/O Level
$\overline{\text{COSMO}\cdot\text{RESET}}$	MA-130 Board IC501 (40)	I	Normally "H". "L" when service interruption is detected or restored.
$\overline{\text{COSMO}\cdot\text{CS}}$	MA-130 Board IC501 (44)	I	Chip select signal from timer microprocessor. V period "L" pulse.
SI・BUS	MA-130 Board IC501 (45)	I	Serial communication data from timer microprocessor. V period "L" pulse.
SO・BUS	MA-130 Board IC501 (46)	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	MA-130 Board IC501 (47)	I	Serial communication clock with timer microprocessor. V period "L" pulse.
S IN 1	MA-130 Board IC501 (79)	I	Serial communication data from tuner memory ROM. 8 msec period "L" pulse.
S OUT 1	MA-130 Board IC501 (80)	O	Serial communication data to tuner memory ROM. 8 msec period "L" pulse.
S CLK 1	MA-130 Board IC501 (81)	O	Serial communication clock to tuner memory ROM. 8 msec period "L" pulse.
MEM CS	MA-130 Board IC501 (75)	O	Chip select signal to tuner memory ROM. 8 msec period "L" pulse.

3-9. SYSTEM CONTROL －AUDIO BLOCK INTERFACE

Signal	Pin. No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOAD-ING	PB	PB・ PAUSE	SLOW	×2	CUE	REVIEW	REC	REC-PAUSE
NA PB	MA-130 Board IC501 (94)	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA-130 Board IC501 (95)	O (O. D)	L	L	L	∗3	H	H	H	H	H	L	L
$\overline{\text{SP}}$	MA-130 Board IC501 ⑩	O	∗1	∗1	∗1	∗2	∗2	∗2	∗2	∗2	∗1	∗1	∗1
REC・$\overline{\text{P}}$	MA-130 Board IC501 ⑤	O	L	L	L	L	L	L	L	L	L	H	L

∗1. Selected by SP/LP selector. SP mode : "L", LP mode : "H".

∗2. Selected by tape recording mode. SP mode : "L", LP/EP mode : "H".

∗3. "H" when CTL signal is not played back.

3-10. SYSTEM CONTROL AND RF MODULATOR－INPUT SELECTION BLOCK INTERFACE

Signal	Pin. No.	I/O	I/O Level
TV/VTR	MA-130 Board IC501 (28)	O	"L" when RF modulator through.
LINE 1	MA-130 Board IC501 (26)	O	∗1. Input select control signal
LINE 2	MA-130 Board IC501 (25)	O	

∗1.

Signal \ Input	Tuner	LINE 1	LINE 2
LINE 1 (26)	L	H	L
LINE 2 (25)	L	L	H

3-11. SERVO SYSTEM CONTROL －MICROPROCESSOR PIN FUNCTION (MA-130 BOARD IC501)

Pin. No.	Port	I/O	Signal	Function
1	PB5/PPO13	O	RF SWP	Video switching pulse output
2	PB4/PPO12	O	Q VD	False VD pulse output
3	PB3/PPO11	O	Q HD ENABLE	False VD control
4	PB2/PPO10	O	AMS	AMS control output
5	PB1/PPO9	O	REC $\overline{\text{P}}$	"H" output when video REC (REC control)
6	PB0/PPO8	O	REC	"H" output when REC
7	PC7/RTO7	O	REC CTL	REC CTL output
8	PC6/RTO6	O	INT VD	Not used
9	PC5/RTO5	O	INDEX	Index control for CTL amp
10	PC4/RTO4	O	$\overline{\text{SP}}$	"L" output when SP mode
11	PC3/RTO3	O	LP	"H" output when LP mode
12	PC2/PPO18	O	EP	"H" output when EP mode
13	PC1/PPO17	O	$\overline{\text{JOG}}$	"L" when special playback
14	PC0/PPO16	O	$\overline{\text{V SP}}$	SP mode for video system
15	PJ7	O	TURBO	"H" output when RENTAL PICTURE
16	PJ6	O	N. C	Not used
17	PJ5	O	NTSC PB	"H" when NTSC (SECAM) playback
18	PJ4	I	PAL M JUDGE	Not used
19	PJ3	O	PAL M HOLD	Not used
20	PJ2	O	C ROT STOP	Not used
21	PJ1	O	N. C	Not used
22	PJ0	I	$\overline{\text{H DET}}$	H sync detection input
23	PD7	O	N. C	Not used
24	PD6	O	N. C	Not used
25	PD5	O	LINE SEL 2	Input select 2

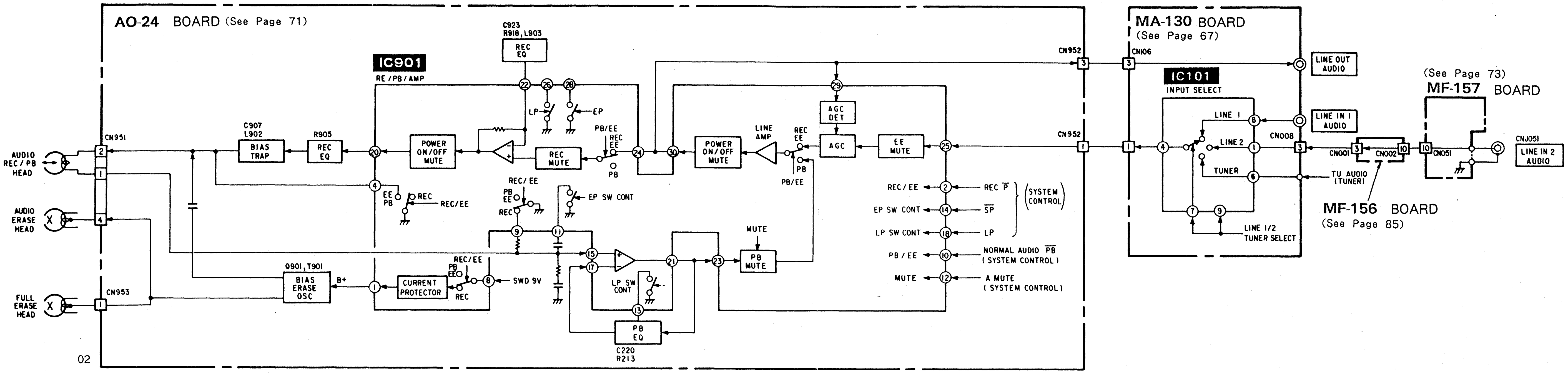
Pin. No.	Port	I/O	Signal	Function
26	PD4	O	LINE SEL 1	Input select 1
27	PD3	O	INPUT MUTE	Input muting
28	PD2	O	$\overline{\text{TV}}$/VTR	Antenna output select signal. "H" : VTR, "L" : TV.
29	PD1	O	N. C	Not used
30	PD0	O	N. C	Not used
31	PH7	O	U	Tuner band select signal
32	PH6	O	VH	
33	PH5	O	VL	
34	PH4	O	VS	
35	PH3	O	SYSTEM 2	Video system select signal
36	PH2	O	SYSTEM 1	
37	PH1	O	SHARP CONT	Sharpness control (for TURBO PICTURE)
38	PH0	O	$\overline{\text{STEP PULS}}$	"L" when capstan STEP is driven.
39	MP	I	MP (Vss)	Fixed at "L" level
40	$\overline{\text{RST}}$	I	$\overline{\text{COSMO RST}}$	System reset input
41	Vss			GND
42	XTAL	O	XTAL	System clock 12MHz
43	EXTAL	I	EXTAL	
44	$\overline{\text{CS0}}$	I	$\overline{\text{COSMO CS}}$	Chip select signal
45	SI0	I	SI0	Signal for serial communication
46	SO0	O	SO0	
47	$\overline{\text{SCK0}}$	I	$\overline{\text{SCK0}}$	
48	PF7/AN11	I	TU AFT	Tuner analog AFT input
49	PF6/AN10	I	DEW	Dew sensor analog input
50	PF5/AN9	I	DESTI	AD port for destination selection
51	PF4/AN8	I	LAMP	End sensor lamp drive output
52	AVss		AVss	UN SW GND
53	AV REF	I	AV REF	AD port reference input. UNSW 5V
54	AV DD		AV DD	UNSW 5V
55	PF3/AF7	I	MODE4	Mechanism section CAM encoder input
56	PF2/AN6	I	MODE3	
57	PF1/AN5	I	MODE2	
58	PF0/AN4	I	MODE1	
59	AN3	I	CAP V	Capstan servo voltage input
60	AN2	I	VIDEO RF	Video RF envelope input
61	AN1	I	N. C (Vss)	GND
62	AN0	I	RF SW POSI	VR input for RF SWP adjustment
63	PG7/EXI1	I	C UP/$\overline{\text{DOWN}}$	Cassette UP/DOWN detection input
64	PG6/EXI0	I	S SENSOR	Supply side end sensor input
65	PG5/SYNC1	I	REC PRF	Erasing protection tab. cassette IN detection input
66	PG4/SYNC0	I	V SYNC	Composite sync input
67	PG3/$\overline{\text{PBCTL}}$	I	$\overline{\text{PB CTL}}$	Playback CTL input
68	PG2/DPG	I	DRM PG	Drum PG input
69	PG1/DFG	I	DRM FG	Drum FG input
70	PG0/CFG	I	CAP FG	Capstan FG input

Pin. No.	Port	I／O	Signal	Function
71	PE7／DAB1	O	CAP STOP	Capstan STOP signal output
72	PE6／DAB0	O	CAP RVS	Capstan reverse signal output
73	PE5／DAA1	O	CAP D／A	Capstan error D／A output
74	PE4／DAA0	O	DRM D／A	Drum error D／A output
75	PE3／PWM1	O	MEM CS	EEPROM chip select
76	PE2／PWM0	O	STEP DRIVE	CTL amp step action control
77	PE1／$\overline{\mathrm{EC}}$／$\overline{\mathrm{INT2}}$	I	VD CTL	Playback CTL input
78	PE0	I	N. C (Vss)	Not used
79	PI7／SI1	I	SI1	Tuner memory ROM serial communication signal
80	PI6／SO1	O	SO1	
81	PI5／$\overline{\mathrm{SCK1}}$	O	$\overline{\mathrm{SCK1}}$	
82	PI4／$\overline{\mathrm{INT1}}$／$\overline{\mathrm{NM1}}$	I	S REEL	S reel sensor input
83	PI3／T0／DD0／ADJ	I	T REEL	T reel sensor input
84	P12／$\overline{\mathrm{PWM}}$	O	$\overline{\mathrm{TU\ PWM}}$	Tuner PWM input
85	RI1／RMC	O	T SENSOR	Take-up side end sensor input
86	TEX	I	H SYNC	H sync input
87	TX	O	N. C	
88	Vss		Vss	GND
89	V DD		V DD	UNSW 5V
90	N. C.		N. C (V DD)	Connected to UNSW 5V
91	PA7／PPO7	O	CAM	CAM motor drive output
92	PA6／PPO6	O	LOAD	Load motor drive output
93	PA5／PPO5	O	CW／$\overline{\mathrm{CCW}}$	Clockwise／counterclockwise signal output
94	PA4／PPO4	O	NAPB	"H" when normal audio playback
95	PA3／PPO3	O	A MUTE	Audio mute output
96	PA2／PPO2	O	$\overline{\mathrm{V\text{-}PB}}$	"L" when video playback
97	PA1／PPO1	O	$\overline{\mathrm{BLUE\ BACK}}$	Compulsion blue back
98	PA0／PPO0	O	$\overline{\mathrm{OSD\ MUTE}}$	OSD input muting
99	PB7／PPO15	O	HEAD SEL	Video head select signal
100	PB6／PPO14	O	$\overline{\mathrm{REC\ INH}}$	CTL amp REC inhibit

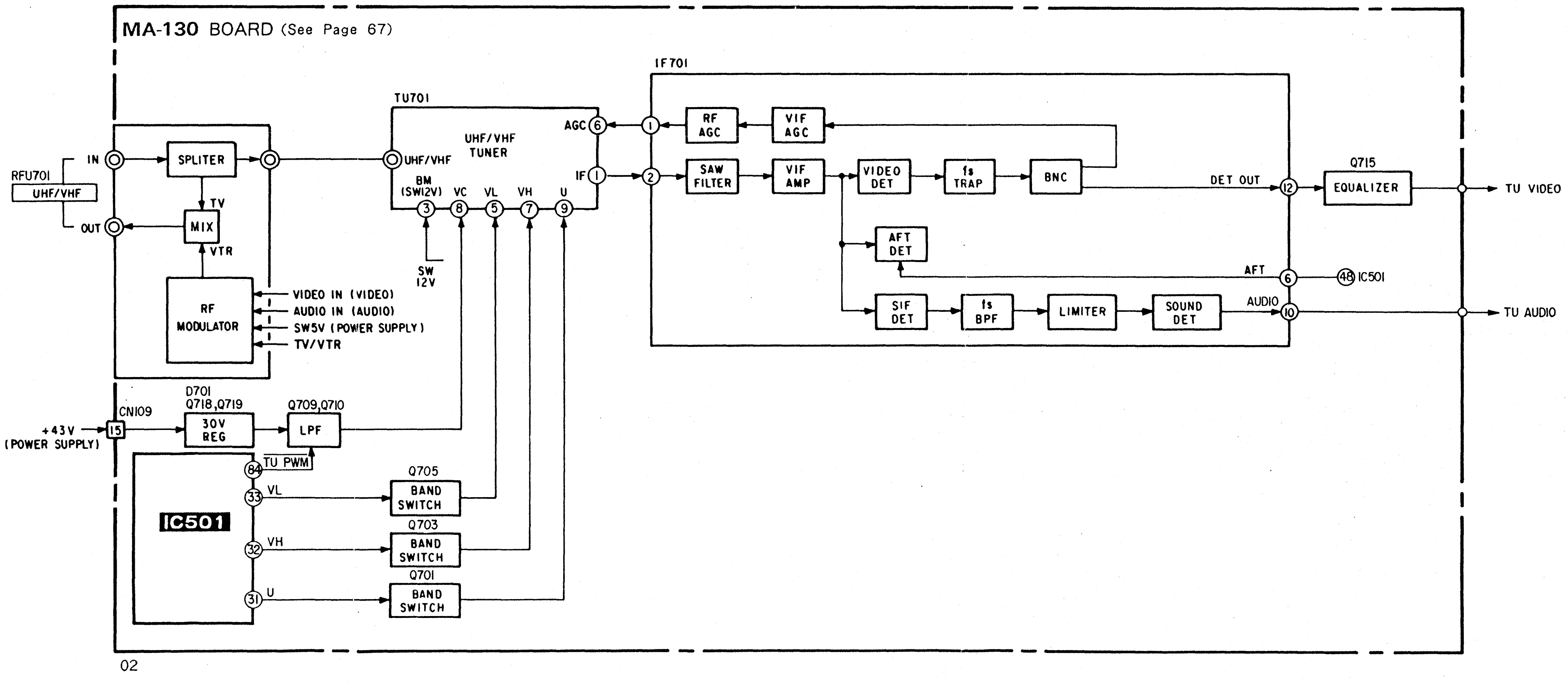
3-12. TIMER/MODE CONTROL－MICROPROCESSOR PIN FUNCTION (MF-156 BOARD IC001)

Pin. No.	Port	I/O	Signal	Function
1	S4/PG0	O	S1	Display segment signal
2	S5/PG1	O	S2	
3	S6/PG2	O	S3	
4	S7/PG3	O	S4	
5	S8/PK0	O	S5	
6	S9/PK1	O	S6	
7	S10/PK2	O	S7	
8	S11/PK3	O	S8	
9	S12/PJ0	O	S9	
10	S13/PJ1	O	S10	
11	S14/PJ2	O	S11	
12	S15/PJ3	O	S12	
13	S16/T15	O	S13	
14	S17/T14	O	S14	
15	S18/T13	O	S15	
16	S19/T12	O	S16	
17	S20/T11	O	S17	
18	S21/T10	O	N. C	Not used
19	S22/T9	O	N. C	
20	S23/T8	O	N. C	
21	T7	O	N. C	
22	T6	O	T6	Display timing signal
23	T5	O	T5	
24	T4	O	T4	
25	T3	O	T3	
26	T2	O	T2	
27	T1	O	T1	
28	T0	O	T0	
29	INT	I	INT	Not used
30	TX	O	TX	Clock for back-up 32.768kHz output
31	TEX	I	ETX	Clock for back-up 32.768kHz input
32	$\overline{\mathrm{RST}}$	I	$\overline{\mathrm{RESET}}$	Reset signal input
33	N. C.		(V DD)	Connected to 5V power
34	V DD		V DD	5V power
35	AD0/PI0	I	K IN 4	KEY input bit 4
36	AD1/PI1	I	K IN 5	KEY input bit 5
37	AD2/PI2	I	K IN 6	KEY input bit 6
38	AD3/PI3	I	K IN 7	KEY input bit 7
39	AD4/PB0	O	K OUT 0	KEY output bit 0
40	AD5/PB1	O	K OUT 1	KEY output bit 1
41	AD6/PB2	O	K OUT 2	KEY output bit 2
42	AD7/PB3	I	K AD	KEY AD input
43	EC	I	$\overline{\mathrm{EC}}$	Not used
44	SCLK	O	$\overline{\mathrm{SCLK0}}$	Serial communication clock
45	SO	O	S IN0	Serial data output
46	SI	I	S OUT0	Serial data input
47	PA0/PX1	O	$\overline{\mathrm{COSMO\ CS}}$	SS microprocessor chip select signal
48	PA1/PX2	O	$\overline{\mathrm{OSD\ CS}}$	CG microprocessor chip select signal
49	PA2	O	$\overline{\mathrm{COSMO\ RST}}$	SS microprocessor reset signal output
50	PA3	O	POWER ON	Power control for SW system. "H" output when power ON.
51	PF0	O	N. C	Not used
52	PF1	O	N. C	
53	PF2	O	N. C	
54	PF3	O	N. C	
55	PE0	O	N. C	
56	PE1	O	N. C	
57	PE2	O	N. C	
58	PE3	O	N. C	
59	PY0	O	N. C	
60	PWM/PY1	O	$\overline{\mathrm{BEEP}}$	PWM output for buzzer
61	WP/PY2	I	$\overline{\mathrm{POWER\ FAIL}}$	"L" when service interruption(service interruption detection)
62	RMC/PY3	I	SIRCS IN	Remote control input
63	PD0	I	N. C (GND)	Not used
64	PD1	I	N. C (GND)	
65	PD2	I	N. C (GND)	
66	PD3	I	K 2P	Select switch for IF SEL (SECAM PB)
67	PC0	I/O	K IN 0	KEY input bit 0
68	PC1	I/O	K IN 1	KEY input bit 1
69	PC2	I/O	K IN 2	KEY input bit 2
70	PC3	I/O	K IN 3	KEY input bit 3
71	Vss		Vss	GND
72	XTAL	O	XTAL	Clock 4.19MHz output
73	N. C.		(V DD)	Connected to 5V power
74	EXTAL	I	EXTAL	Clock 4.19MHz input
75	V REF		V REF	A/D input reference power
76	V FDP		V FDP	Power for fluorescent indicator
77	PH0/S0	O	N. C	Not used
78	PH1/S1	O	N. C	
79	PH2/S2	O	LED1	TURBO PICTURE/EDIT LED
80	PH3/S3	O	LED2	NTSC (F-SECAM) PLAYBACK LED

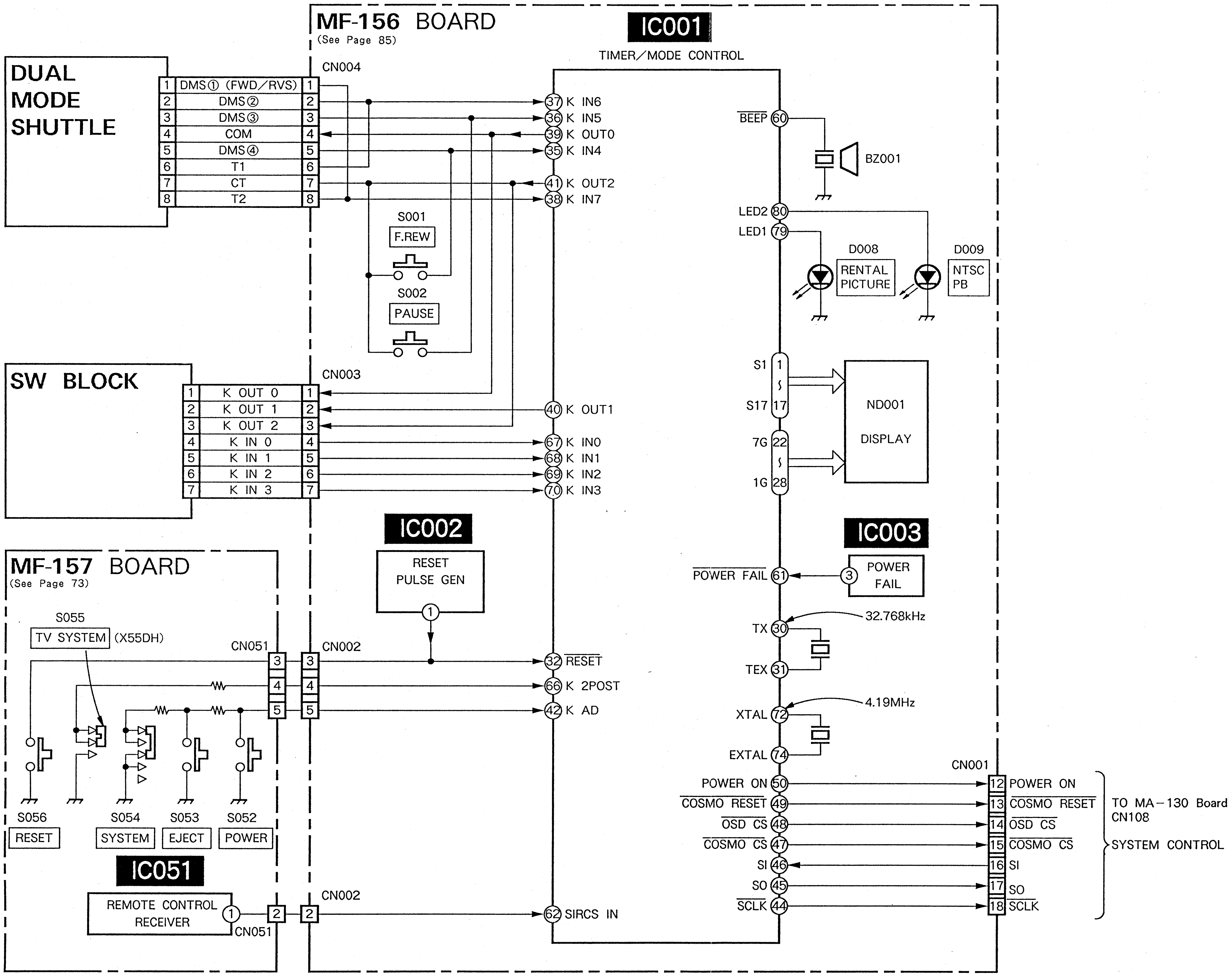
3-13. AUDIO BLOCK DIAGRAM


AO-24 BOARD (See Page 71)
IC901
RE/PB/AMP
C923
R918, L903
REC EQ
C907
L902
BIAS TRAP
R905
REC EQ
POWER ON/OFF MUTE
REC MUTE
LP
EP
PB/EE
REC
EE
PB
REC/EE
EP SW CONT
LP SW CONT
POWER ON/OFF MUTE
LINE AMP
AGC DET
AGC
EE MUTE
MUTE
PB MUTE
Q901, T901
BIAS ERASE OSC
B+
CURRENT PROTECTOR
SWD 9V
PB EQ
C220
R213
CN951
CN953
CN952
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
REC/EE
EP SW CONT
LP SW CONT
PB/EE
MUTE
REC P
SP
LP
SYSTEM CONTROL
NORMAL AUDIO PB (SYSTEM CONTROL)
A MUTE (SYSTEM CONTROL)
02
MA-130 BOARD (See Page 67)
CN106
IC101
INPUT SELECT
LINE 1
LINE 2
TUNER
LINE 1/2 TUNER SELECT
CN008
LINE OUT AUDIO
LINE IN 1 AUDIO
CN001
CN002
TU AUDIO (TUNER)
MF-156 BOARD (See Page 85)
(See Page 73)
MF-157 BOARD
CN051
CNJ051
LINE IN 2 AUDIO

3-14. TUNER BLOCK DIAGRAM

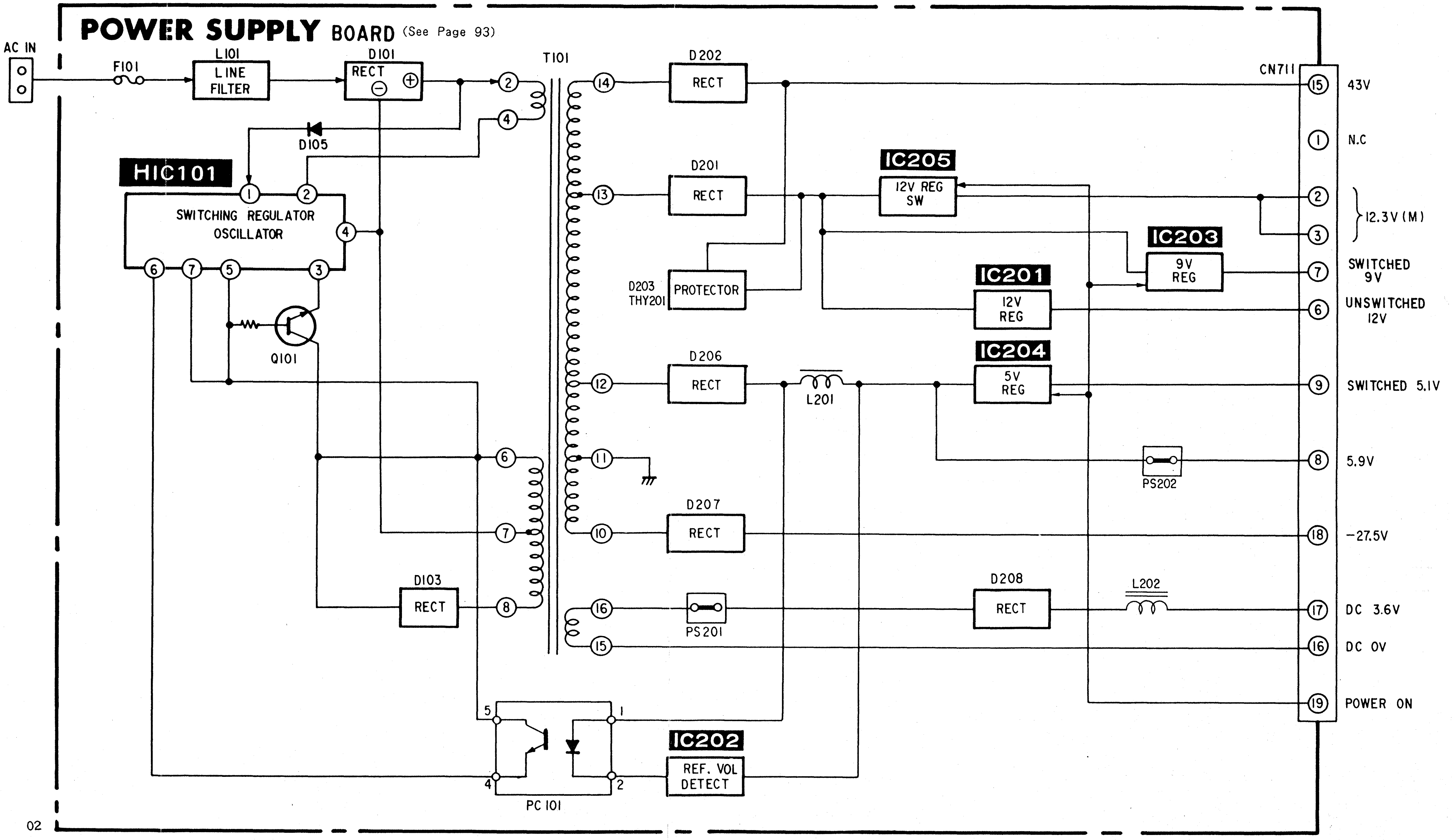

MA-130 BOARD (See Page 67)
RFU701
UHF/VHF
IN
OUT
SPLITER
TV
MIX
VTR
RF MODULATOR
VIDEO IN (VIDEO)
AUDIO IN (AUDIO)
SW5V (POWER SUPPLY)
TV/VTR
TU701
UHF/VHF TUNER
AGC
IF
BM (SW12V)
VC
VL
VH
U
SW 12V
IF701
RF AGC
VIF AGC
SAW FILTER
VIF AMP
VIDEO DET
fs TRAP
BNC
AFT DET
SIF DET
fs BPF
LIMITER
SOUND DET
DET OUT
AFT
AUDIO
IC501
Q715
EQUALIZER
TU VIDEO
TU AUDIO
CN109
+43V (POWER SUPPLY)
D701
Q718, Q719
30V REG
Q709, Q710
LPF
TU PWM
IC501
VL
VH
U
Q705
BAND SWITCH
Q703
BAND SWITCH
Q701
BAND SWITCH
02

3-15. TIMER AND MODE CONTROL BLOCK DIAGRAM


MF-156 BOARD
(See Page 85)
IC001
TIMER/MODE CONTROL
DUAL MODE SHUTTLE
CN004
1 DMS① (FWD/RVS) 1
2 DMS② 2
3 DMS③ 3
4 COM 4
5 DMS④ 5
6 T1 6
7 CT 7
8 T2 8
37 K IN6
36 K IN5
39 K OUT0
35 K IN4
41 K OUT2
38 K IN7
S001
F.REW
S002
PAUSE
SW BLOCK
CN003
1 K OUT 0 1
2 K OUT 1 2
3 K OUT 2 3
4 K IN 0 4
5 K IN 1 5
6 K IN 2 6
7 K IN 3 7
40 K OUT1
67 K IN0
68 K IN1
69 K IN2
70 K IN3
BEEP 60
BZ001
LED2 80
LED1 79
D008
RENTAL PICTURE
D009
NTSC PB
S1 1
S17 17
7G 22
1G 28
ND001
DISPLAY
IC002
RESET PULSE GEN
1
IC003
POWER FAIL
3
POWER FAIL 61
TX 30
32.768kHz
TEX 31
XTAL 72
4.19MHz
EXTAL 74
MF-157 BOARD
(See Page 73)
S055
TV SYSTEM
(X55DH)
CN051
CN002
3
4
5
32 RESET
66 K 2POST
42 K AD
S056
RESET
S054
SYSTEM
S053
EJECT
S052
POWER
IC051
REMOTE CONTROL RECEIVER
1
2
CN051
CN002
62 SIRCS IN
CN001
POWER ON 50 → 12 POWER ON
COSMO RESET 49 → 13 COSMO RESET
OSD CS 48 → 14 OSD CS
COSMO CS 47 → 15 COSMO CS
SI 46 ← 16 SI
SO 45 → 17 SO
SCLK 44 → 18 SCLK
TO MA-130 Board CN108
SYSTEM CONTROL

02

3-16. POWER SUPPLY BLOCK DIAGRAM

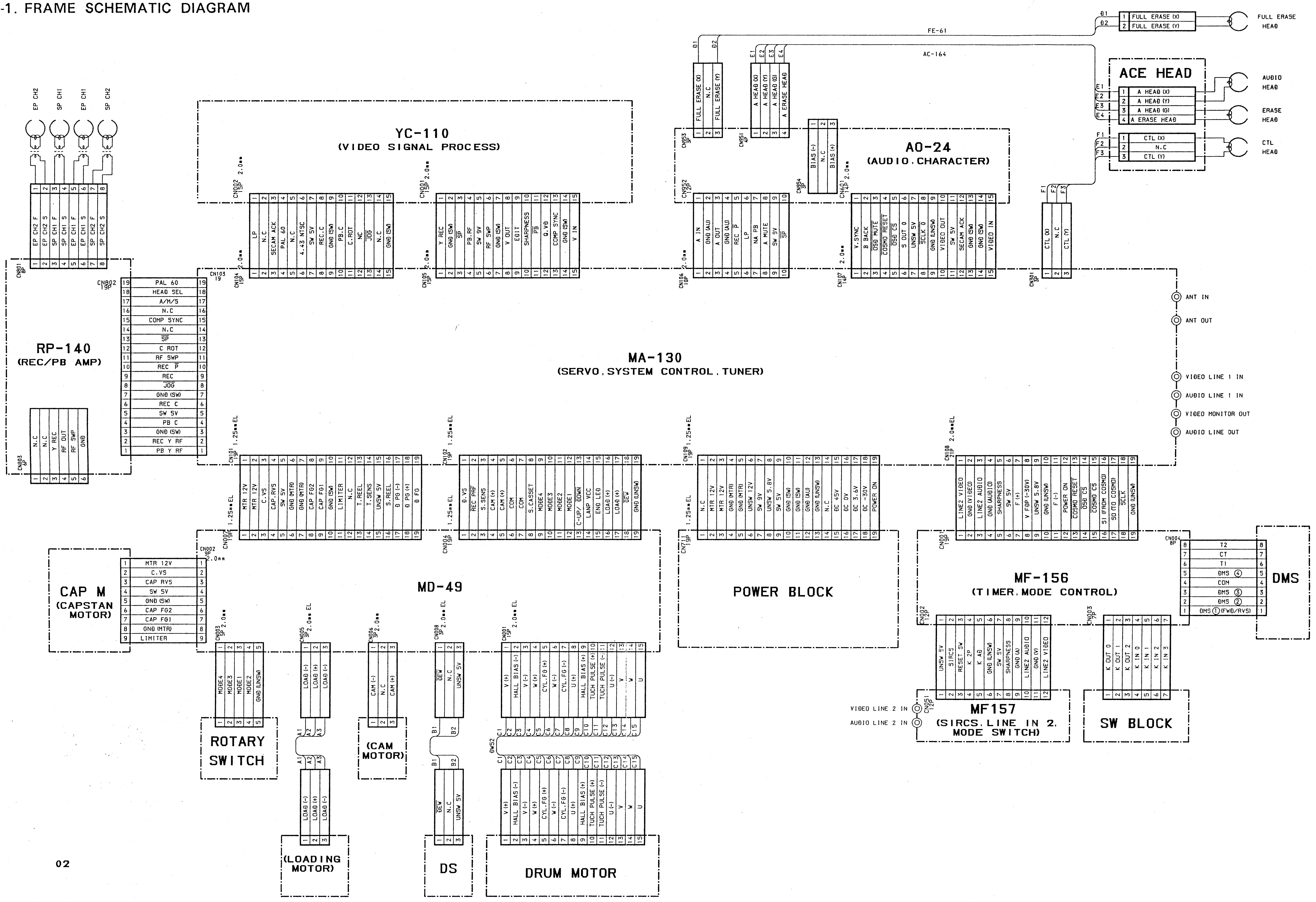


POWER SUPPLY BOARD (See Page 93)
AC IN
F101
L101
LINE FILTER
D101
RECT
T101
D105
HIC101
SWITCHING REGULATOR OSCILLATOR
Q101
D103
RECT
PC101
D202
RECT
D201
RECT
D203 THY201
PROTECTOR
D206
RECT
L201
D207
RECT
PS201
IC202
REF. VOL DETECT
IC205
12V REG SW
IC203
9V REG
IC201
12V REG
IC204
5V REG
PS202
D208
RECT
L202
CN711
43V
N.C
12.3V (M)
SWITCHED 9V
UNSWITCHED 12V
SWITCHED 5.1V
5.9V
-27.5V
DC 3.6V
DC 0V
POWER ON
02

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


YC-110
(VIDEO SIGNAL PROCESS)
AO-24
(AUDIO, CHARACTER)
ACE HEAD
FULL ERASE HEAD
AUDIO HEAD
ERASE HEAD
CTL HEAD
FE-61
AC-164
EP CH2
SP CH1
EP CH1
SP CH2
RP-140
(REC/PB AMP)
MA-130
(SERVO, SYSTEM CONTROL, TUNER)
ANT IN
ANT OUT
VIDEO LINE 1 IN
AUDIO LINE 1 IN
VIDEO MONITOR OUT
AUDIO LINE OUT
CAP M
(CAPSTAN MOTOR)
MD-49
POWER BLOCK
MF-156
(TIMER, MODE CONTROL)
DMS
ROTARY SWITCH
(CAM MOTOR)
(LOADING MOTOR)
DS
DRUM MOTOR
MF157
(SIRCS, LINE IN 2, MODE SWITCH)
VIDEO LINE 2 IN
AUDIO LINE 2 IN
SW BLOCK
02

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards :

- o— : indicates a lead wire mounted on the componet side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side. *

> Caution :
>
> Pattern face side : (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
>
> Parts face side : (Component Side) Parts on the parts face side seen from the parts face are indicated.

*

For schematic diagram :

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (chip resistors : 1/10W) unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic carve B, unless otherwise noted.
- ⊡ : nonflammeble resistor.
- ⊡∿ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair. *
- ━━ : B+ line. *
- ╍╍ : B− line. *
- Voltages are dc between measurement points and ground unless otherwise noted. *
- Readings are taken with color-bar signal input. *
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *
- ⇨ : IN/OUT direction of B line (+, −). *
- Circled numbers refer to waveforms. *

* : indicated by the color red.

> When indicating parts by reference number, please include the board name.

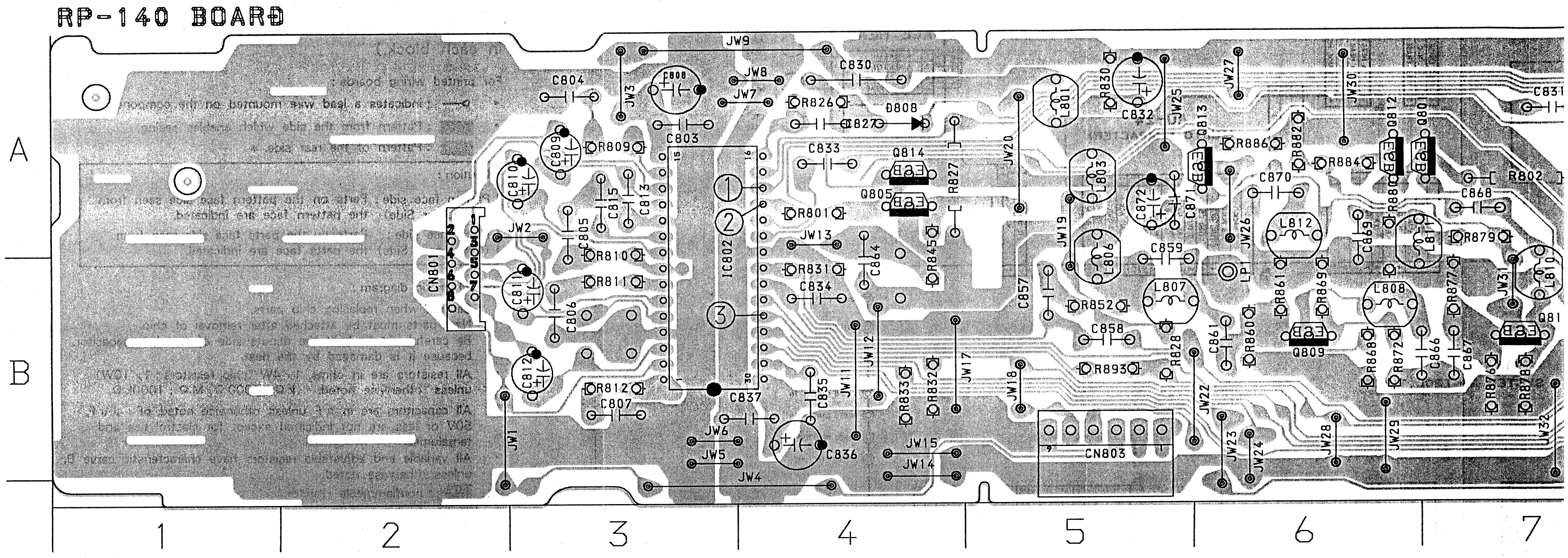
> **Note:** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

RP-140 (REC/PB AMP) PRINTED WIRING BOARD

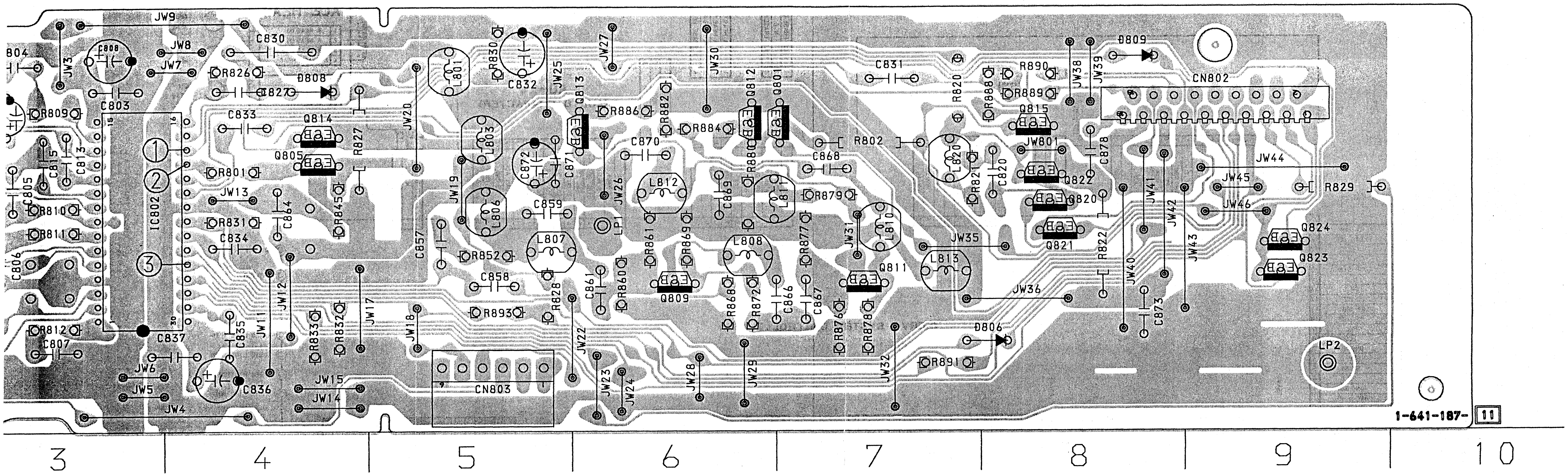
—Ref. No. RP-140 BOARD : 1,000 Series—

RP-140 BOARD

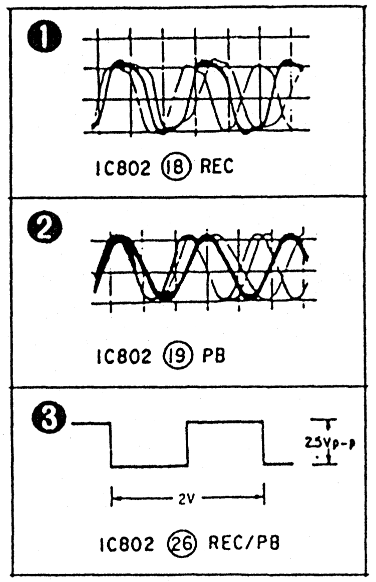
CN801	B-2
CN802	A-9
CN803	B-5
D806	B-8
D808	A-4
D809	A-8
IC802	B-3
Q801	A-6
Q805	A-4
Q809	B-6
Q811	A-7
Q812	A-6
Q813	A-6
Q814	A-4
Q815	A-8
Q820	A-8
Q821	B-8
Q822	A-8
Q823	B-9
Q824	B-9


RP-140 BOARD
A
B
1
2
3
4
5
6
7
CN801
CN803
IC802
C804
C803
C808
C809
C810
C811
C812
C805
C806
C807
C813
C815
C830
C831
C832
C833
C834
C835
C836
C837
C857
C858
C859
C861
C864
C866
C867
C868
C869
C870
C871
C872
R801
R802
R809
R810
R811
R812
R826
R827
R828
R830
R831
R832
R833
R845
R852
R860
R861
R868
R869
R872
R876
R877
R878
R879
R881
R882
R884
R886
R893
D808
Q805
Q809
Q812
Q813
Q814
L801
L803
L806
L807
L808
L810
L812
LP1
JW1
JW2
JW3
JW4
JW5
JW6
JW7
JW8
JW9
JW11
JW12
JW13
JW14
JW15
JW17
JW18
JW19
JW20
JW22
JW23
JW24
JW25
JW26
JW27
JW28
JW29
JW30
JW31
JW32
①
②
③

02


JW9
C830
JW8
JW7
C808
804
JW3
C803
R826
C827
D808
R809
C833
Q814
Q805
R827
JW20
C815
C813
IC802
R801
JW13
C805
R810
C864
R831
R845
R811
C834
C806
JW12
JW11
R833
R832
JW17
JW18
R812
C837
C835
C807
JW6
JW5
JW4
C836
JW15
JW14
L801
R830
C832
JW25
L803
C872
C871
Q813
JW19
L806
C859
C857
R852
L807
C858
R893
R828
CN803
JW22
JW23
JW24
JW27
R886
R882
C870
JW26
LP1
L812
C861
R860
R861
R869
Q809
JW30
R884
Q812
Q801
R880
C869
L811
R868
L808
R872
C866
C867
JW28
JW29
C868
R802
R879
R877
JW31
L810
R876
R878
Q811
JW32
R891
D806
JW35
L813
JW36
C831
R820
L820
R821
C820
R888
R890
R889
Q815
JW801
Q822
Q820
Q821
R822
JW38
JW39
D809
CN802
C878
JW40
JW41
JW42
JW43
C873
JW44
JW45
JW46
R829
Q824
Q823
LP2
1-641-187-11
3
4
5
6
7
8
9
10

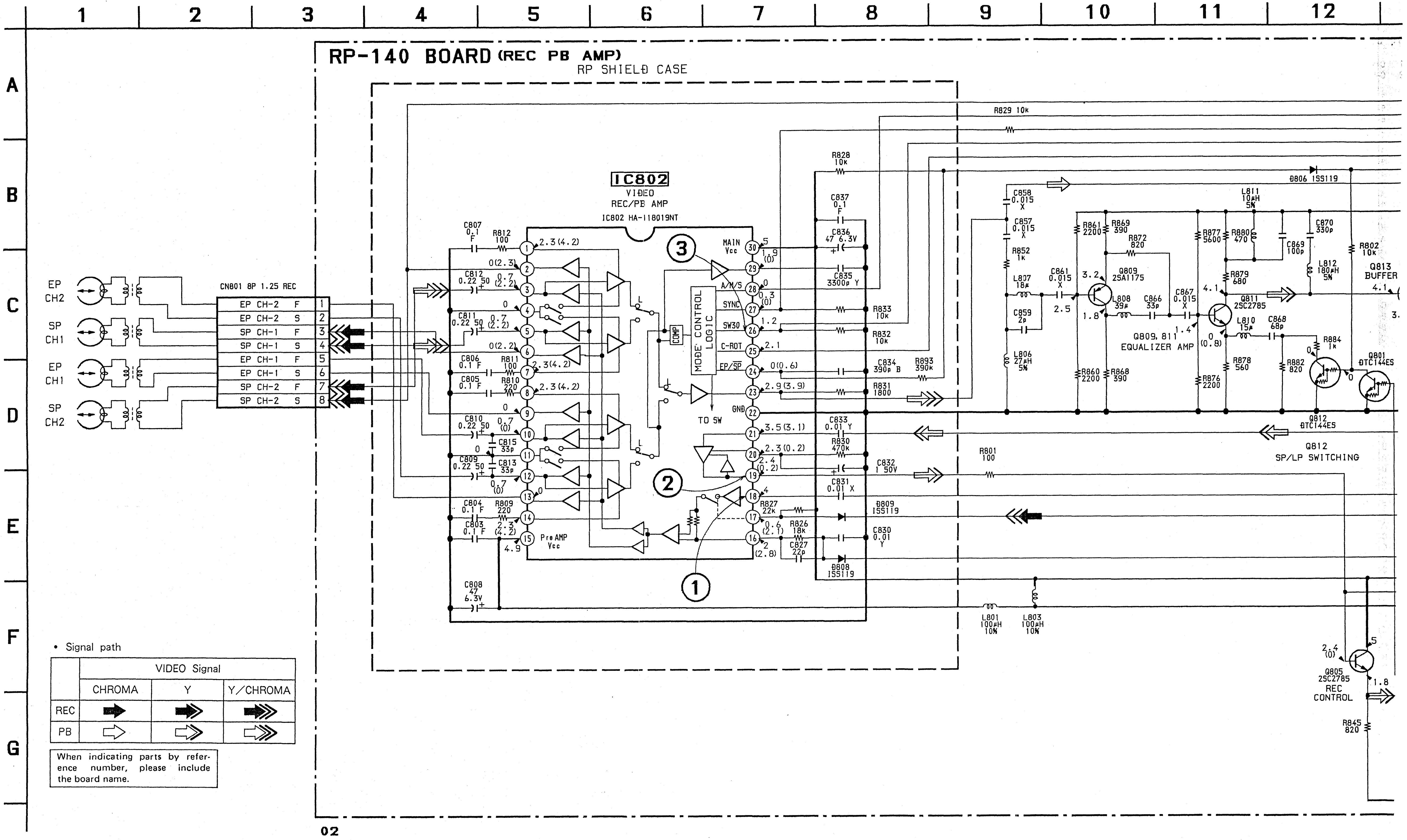
RP.140 Board



REC/PB AMP　REC/PB AMP

RP-140 (REC／PB AMP) SCHEMATIC DIAGRAM

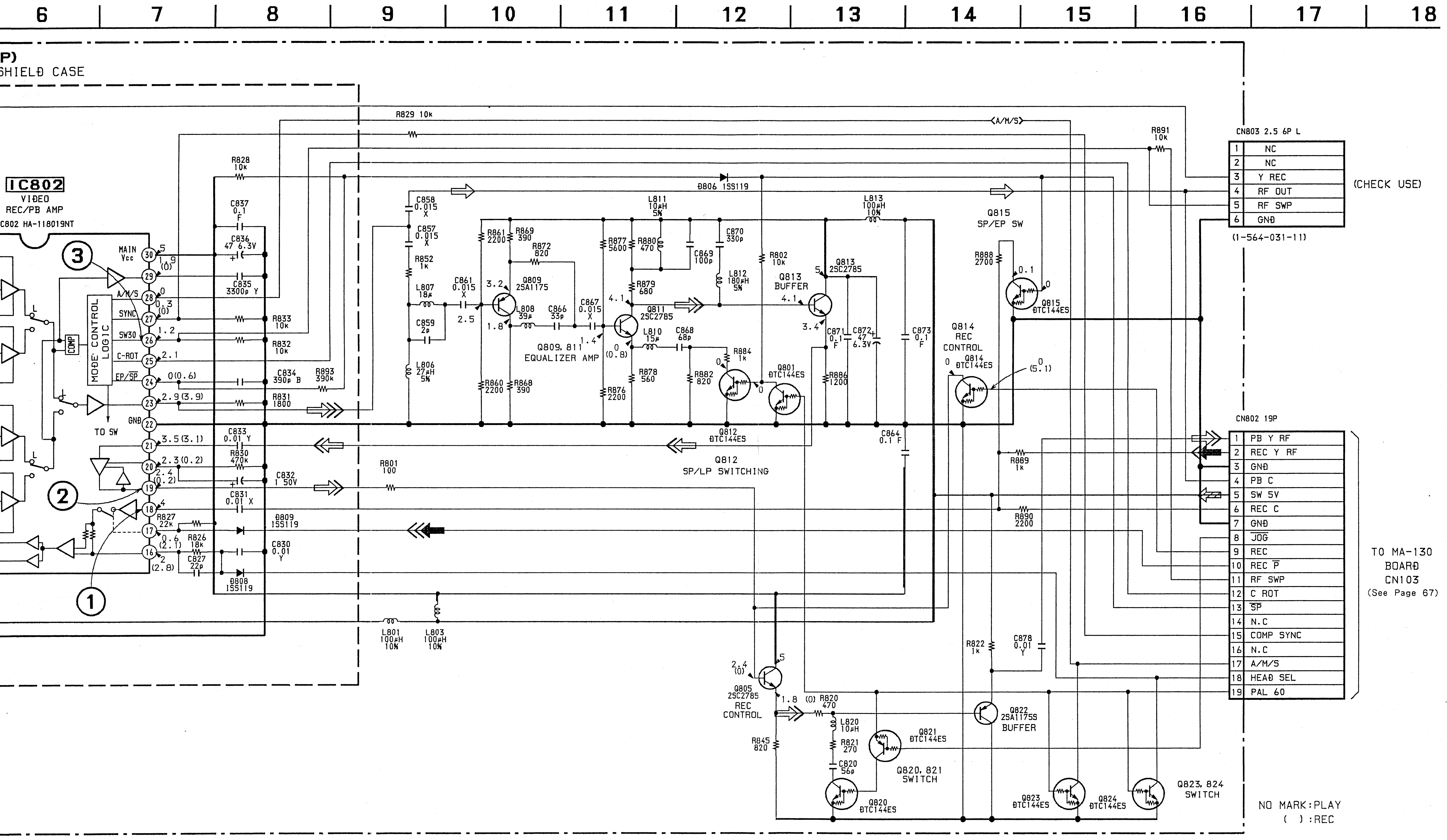
—Ref. No. RP-140 BOARD : 1,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
RP-140 BOARD (REC PB AMP)
RP SHIELD CASE
IC802
VIDEO
REC/PB AMP
IC802 HA-118019NT
MODE CONTROL LOGIC
COMP
MAIN Vcc
A/M/S
SYNC
SW30
C-ROT
EP/SP
GND
TO SW
Pre AMP Vcc
EP CH2
SP CH1
EP CH1
SP CH2
CN801 8P 1.25 REC
EP CH-2 F
EP CH-2 S
SP CH-1 F
SP CH-1 S
EP CH-1 F
EP CH-1 S
SP CH-2 F
SP CH-2 S
C807 0.1 F
R812 100
C812 0.22 50
C811 0.22 50
C806 0.1 F
R811 100
C805 0.1 F
R810 220
C810 0.22 50
C815 33p
C809 0.22 50
C813 33p
C804 0.1 F
R809 220
C803 0.1 F
C808 47 6.3V
R828 10k
C837 0.1 F
C836 47 6.3V
C835 3300p Y
R833 10k
R832 10k
C834 390p B
R893 390k
R831 1800
C833 0.01 Y
R830 470k
C832 1 50V
C831 0.01 X
R827 22k
D809 1SS119
R826 18k
C830 0.01 Y
C827 22p
D808 1SS119
R829 10k
C858 0.015 X
C857 0.015 X
R852 1k
L807 18μ
C859 2p
L806 27μH 5%
C861 0.015 X
R861 2200
R869 390
R872 820
Q809 2SA1175
L808 39μ
C866 33p
C867 0.015 X
Q809, 811 EQUALIZER AMP
R860 2200
R868 390
R877 5600
R880 470
C869 100p
C870 330p
R879 680
Q811 2SC2785
L810 15μ
C868 68p
R878 560
R876 2200
R882 820
R884 1k
L811 10μH 5%
D806 1SS119
R802 10k
L812 180μH 5%
Q813 BUFFER
Q801 DTC144ES
Q812 DTC144ES
Q812 SP/LP SWITCHING
R801 100
L801 100μH 10%
L803 100μH 10%
Q805 2SC2785 REC CONTROL
R845 820
02

• Signal path

	VIDEO Signal		
	CHROMA	Y	Y／CHROMA
REC	➡	➡➡	➡➡➡
PB	⇨	⇨⇨	⇨⇨⇨

When indicating parts by reference number, please include the board name.


6
7
8
9
10
11
12
13
14
15
16
17
18
P)
SHIELD CASE
IC802
VIDEO
REC/PB AMP
IC802 HA-118019NT
MAIN Vcc
A/M/S
SYNC
SW30
C-ROT
EP/SP
GND
MODE CONTROL LOGIC
COMP
TO SW
③
②
①
R828 10k
C837 0.1 F
C836 47 6.3V
C835 3300p Y
R833 10k
R832 10k
C834 390p B
R893 390k
R831 1800
C833 0.01 Y
R830 470k
C832 1 50V
C831 0.01 X
R827 22k
R826 18k
C827 22p
D809 1SS119
C830 0.01 Y
D808 1SS119
R829 10k
R801 100
L801 100μH 10%
L803 100μH 10%
C858 0.015 X
C857 0.015 X
R852 1k
L807 18μ
C859 2p
L806 27μH 5%
C861 0.015 X
R861 2200
R869 390
R872 820
Q809 2SA1175
L808 39μ
C866 33p
C867 0.015 X
R860 2200
R868 390
Q809, 811 EQUALIZER AMP
R877 5600
R880 470
R879 680
Q811 2SC2785
L810 15μ
C868 68p
R878 560
R876 2200
L811 10μH 5%
C869 100p
C870 330p
L812 180μH 5%
R884 1k
R882 820
D806 1SS119
R802 10k
Q813 BUFFER
Q813 2SC2785
L813 100μH 10%
C871 0.1 F
C872 47 6.3V
R886 1200
C873 0.1 F
Q801 DTC144ES
Q812 DTC144ES
Q812 SP/LP SWITCHING
C864 0.1 F
Q814 REC CONTROL
Q814 DTC144ES
Q815 SP/EP SW
R888 2700
Q815 DTC144ES
R891 10k
R889 1k
R890 2200
R822 1k
C878 0.01 Y
Q805 2SC2785 REC CONTROL
R845 820
R820 470
L820 10μH
R821 270
C820 56p
Q820 DTC144ES
Q821 DTC144ES
Q820, 821 SWITCH
Q822 2SA1175S BUFFER
Q823 DTC144ES
Q824 DTC144ES
Q823, 824 SWITCH
<A/M/S>
CN803 2.5 6P L
1 NC
2 NC
3 Y REC
4 RF OUT
5 RF SWP
6 GND
(1-564-031-11)
(CHECK USE)
CN802 19P
1 PB Y RF
2 REC Y RF
3 GND
4 PB C
5 SW 5V
6 REC C
7 GND
8 JOG
9 REC
10 REC P
11 RF SWP
12 C ROT
13 SP
14 N.C
15 COMP SYNC
16 N.C
17 A/M/S
18 HEAD SEL
19 PAL 60
TO MA-130 BOARD CN103 (See Page 67)
NO MARK:PLAY
( ):REC

REC/PB AMP REC/PB AMP

YC-110 (VIDEO SIGNAL PROCESS) PRINTED WIRING BOARD

—Ref. No. YC-110 BOARD : 6,000 Series—

< DIODE >

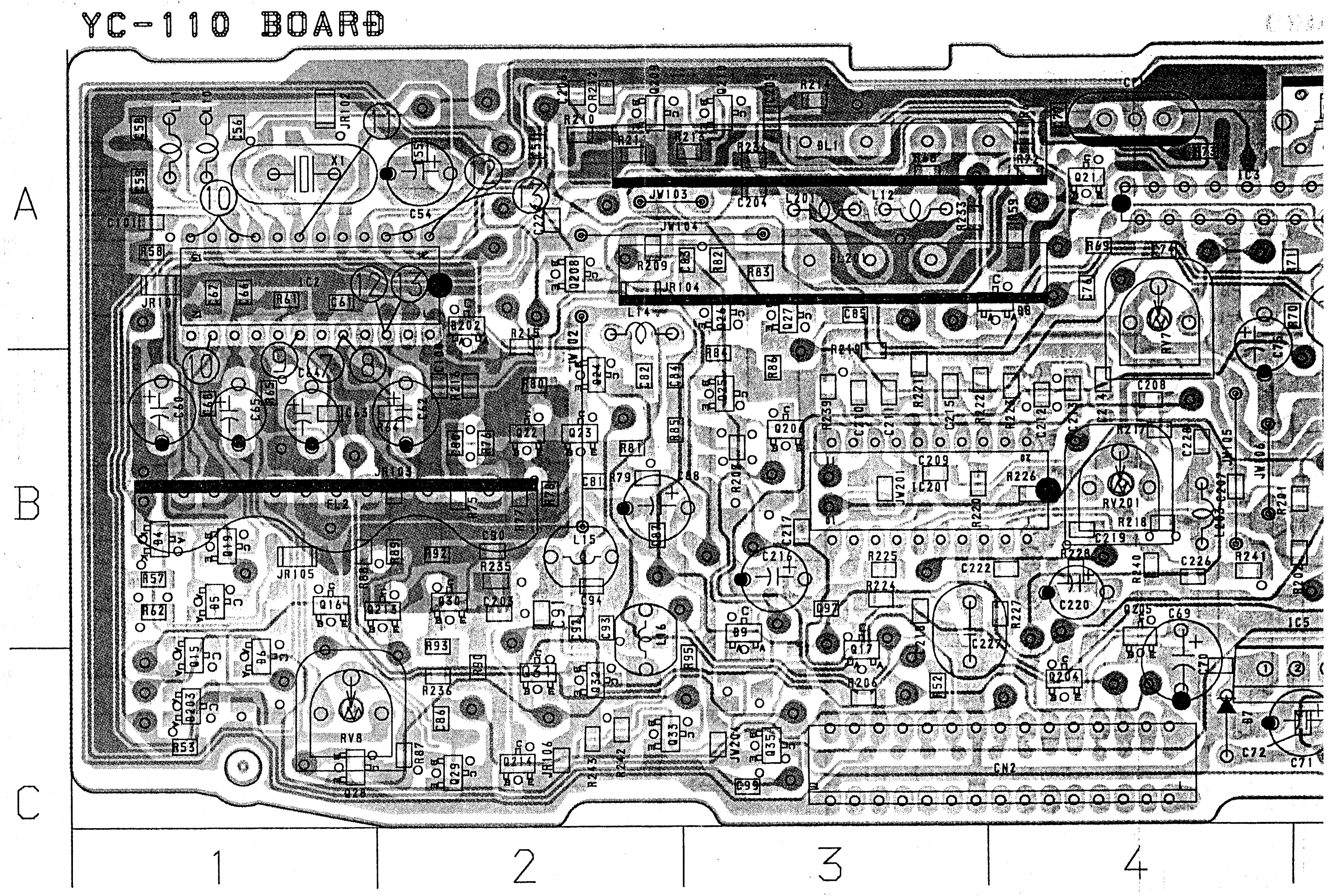
D002	8-719-400-18	DIODE MA152WK
D003	8-719-400-18	DIODE MA152WK
D004	8-719-104-34	DIODE 1S2836
D006	8-719-400-18	DIODE MA152WK
D008	8-719-400-18	DIODE MA152WK
D009	8-719-400-18	DIODE MA152WK
D010	8-719-400-18	DIODE MA152WK
D201	8-719-400-18	DIODE MA152WK
D202	8-719-400-18	DIODE MA152WK
D203	8-719-400-18	DIODE MA152WK

< TRANSISTOR >

Q001	8-729-100-66	TRANSISTOR 2SC1623
Q002	8-729-901-47	TRANSISTOR DTA143EK
Q003	8-729-901-06	TRANSISTOR DTA144EK
Q004	8-729-901-01	TRANSISTOR DTC144EK
Q006	8-729-216-22	TRANSISTOR 2SA1162-G
Q007	8-729-216-22	TRANSISTOR 2SA1162-G
Q008	8-729-100-66	TRANSISTOR 2SC1623
Q009	8-729-100-66	TRANSISTOR 2SC1623
Q010	8-729-216-22	TRANSISTOR 2SA1162-G
Q012	8-729-216-22	TRANSISTOR 2SA1162-G
Q013	8-729-216-22	TRANSISTOR 2SA1162-G
Q015	8-729-901-06	TRANSISTOR DTA144EK
Q017	8-729-901-06	TRANSISTOR DTA144EK
Q019	8-729-901-01	TRANSISTOR DTC144EK
Q021	8-729-901-03	TRANSISTOR DTC144WK
Q022	8-729-100-66	TRANSISTOR 2SC1623
Q023	8-729-100-66	TRANSISTOR 2SC1623
Q024	8-729-901-06	TRANSISTOR DTA144EK
Q025	8-729-216-22	TRANSISTOR 2SA1162-G
Q026	8-729-100-66	TRANSISTOR 2SC1623
Q027	8-729-100-66	TRANSISTOR 2SC1623
Q028	8-729-901-01	TRANSISTOR DTC144EK
Q029	8-729-216-22	TRANSISTOR 2SA1162-G
Q030	8-729-100-66	TRANSISTOR 2SC1623
Q031	8-729-901-01	TRANSISTOR DTC144EK
Q032	8-729-901-01	TRANSISTOR DTC144EK
Q033	8-729-100-66	TRANSISTOR 2SC1623
Q034	8-729-901-01	TRANSISTOR DTC144EK
Q035	8-729-901-06	TRANSISTOR DTA144EK
Q201	8-729-100-66	TRANSISTOR 2SC1623
Q202	8-729-100-66	TRANSISTOR 2SC1623
Q204	8-729-901-06	TRANSISTOR DTA144EK
Q205	8-729-901-01	TRANSISTOR DTC144EK
Q206	8-729-901-01	TRANSISTOR DTC144EK
Q208	8-729-901-03	TRANSISTOR DTC144WK
Q209	8-729-100-66	TRANSISTOR 2SC1623
Q210	8-729-100-66	TRANSISTOR 2SC1623
Q213	8-729-100-66	TRANSISTOR 2SC1623
Q214	8-729-901-01	TRANSISTOR DTC144EK

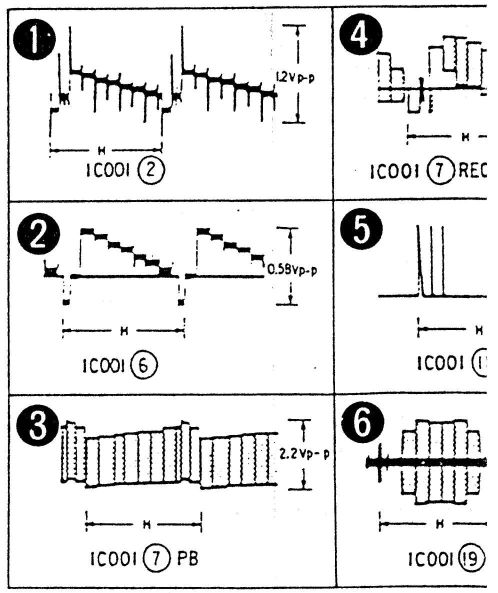
YC-110 BOARD

CN001	C-5
CN002	C-4
D002	B-6
D003	B-6
D004	B-1
D006	C-1
D007	C-4
D008	A-4
D009	B-3
D010	B-6
D201	B-6
D202	A-2
D203	C-1
IC001	B-7
IC002	A-1
IC003	A-4
IC004	A-7
IC005	C-5
IC201	B-3
Q001	C-7
Q002	B-5
Q003	B-6
Q004	C-5
Q006	A-6
Q007	A-6
Q008	A-6
Q009	A-5
Q010	A-6
Q012	A-7
Q013	A-7
Q015	C-1
Q017	C-3
Q019	B-1
Q021	A-4
Q022	B-2
Q023	B-2
Q024	B-2
Q025	B-3
Q026	A-3
Q027	A-3
Q028	C-1
Q029	C-2
Q030	B-2
Q031	C-2
Q032	C-2
Q033	C-2
Q034	B-6
Q035	C-3
Q201	B-5
Q202	B-5
Q204	C-4
Q205	B-4
Q206	B-3
Q208	A-2
Q209	A-2
Q210	A-3
Q213	B-2
Q214	C-2



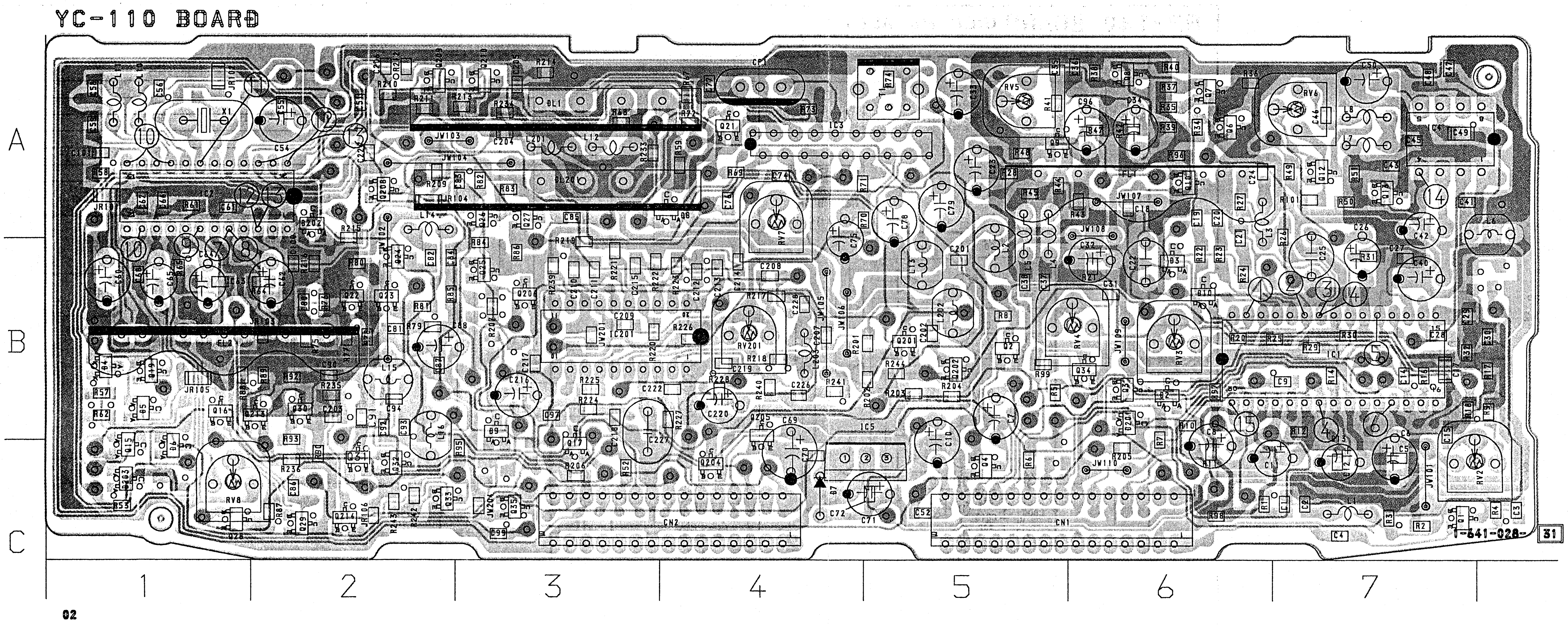
02

YC-110 Board

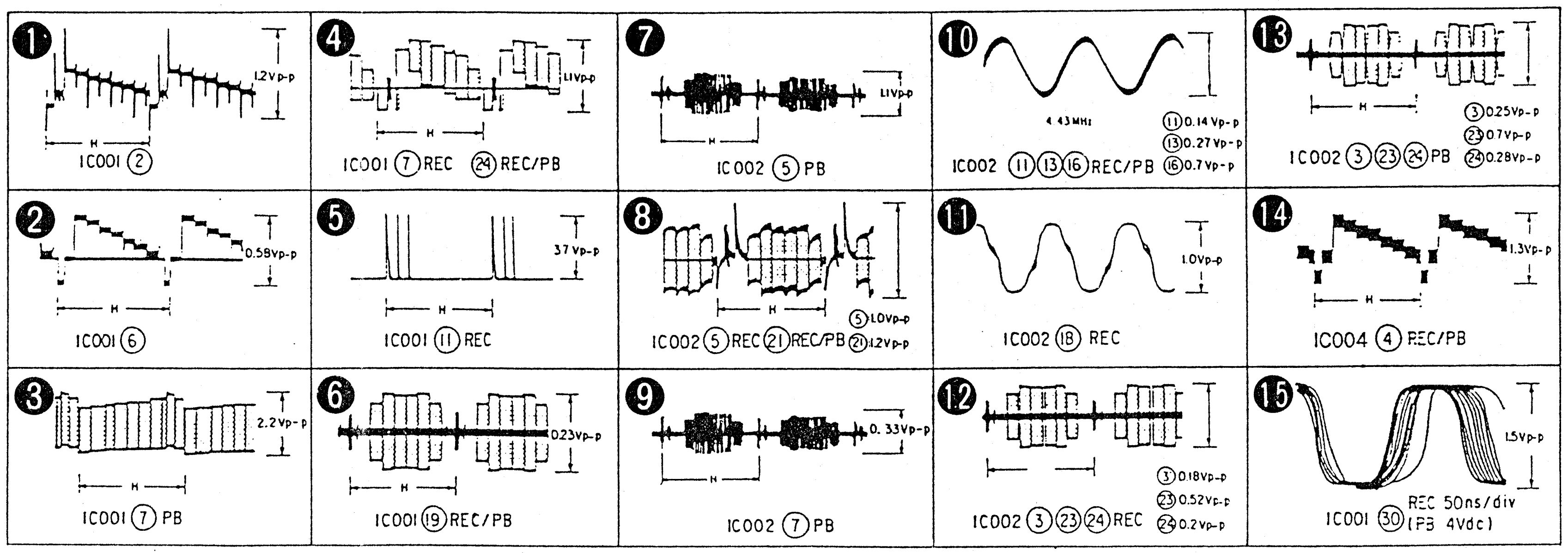


YC-110 (VIDEO SIGNAL PROCESS) PRINTED WIRING BOARD

—Ref. No. YC-110 BOARD : 6,000 Series—

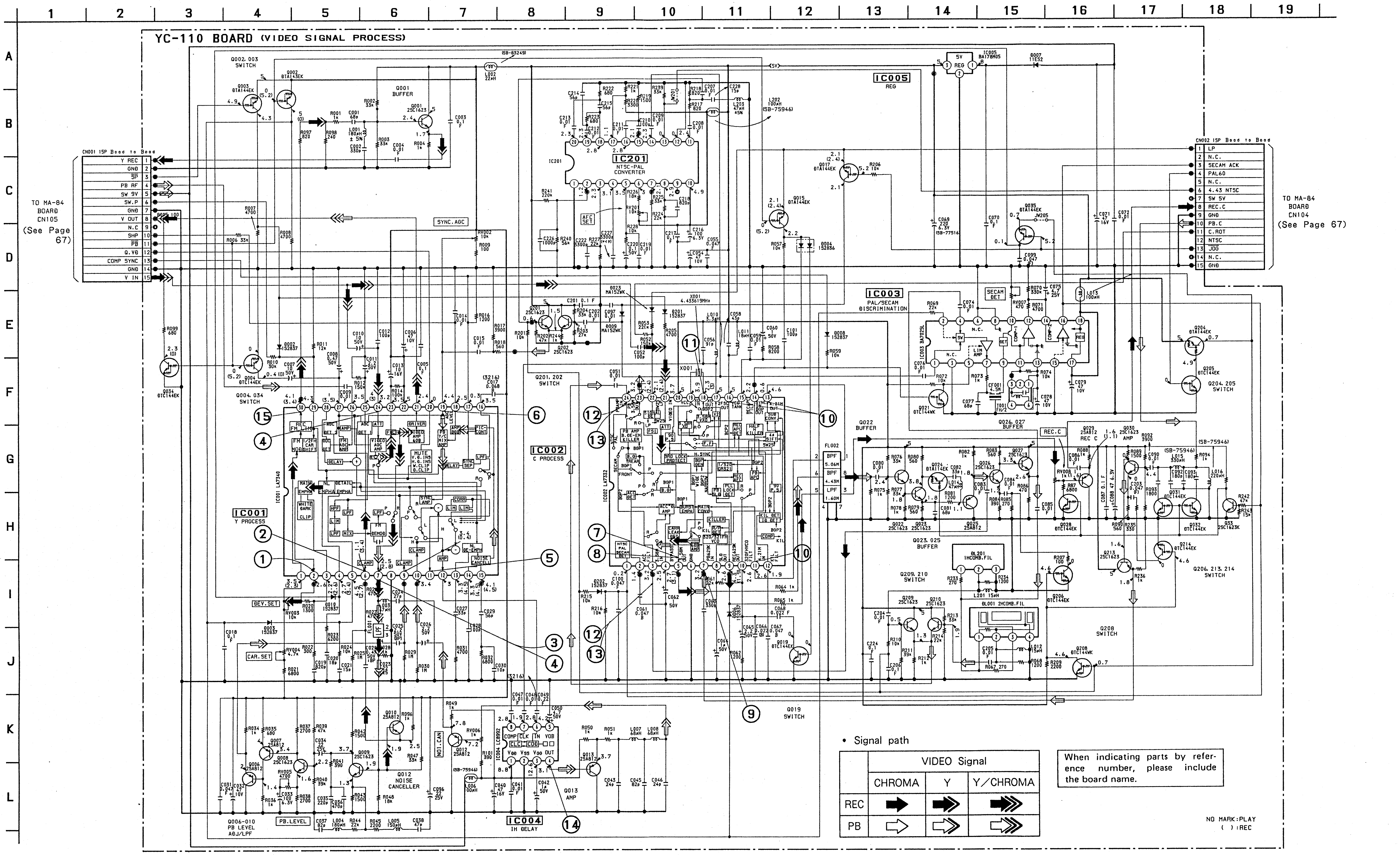

YC-110 BOARD
A
B
C
1
2
3
4
5
6
7
1-641-028-
31
02

YC-110 Board



YC-110 (VIDEO SIGNAL PROCESS) SCHEMATIC DIAGRAM

—Ref. No. YC-110 BOARD : 6,000 Series—


YC-110 BOARD (VIDEO SIGNAL PROCESS)
CN001 15P Board to Board
1 Y REC
2 GND
3 SP
4 PB RF
5 SW 9V
6 SW.P
7 GND
8 V OUT
9 N.C
10 SHP
11 PB
12 Q.V0
13 COMP SYNC
14 GND
15 V IN
TO MA-84 BOARD CN105 (See Page 67)
CN002 15P Board to Board
1 LP
2 N.C.
3 SECAM ACK
4 PAL60
5 N.C.
6 4.43 NTSC
7 SW 5V
8 REC.C
9 GND
10 PB.C
11 C.ROT
12 NTSC
13 JOG
14 N.C.
15 GND
TO MA-84 BOARD CN104 (See Page 67)
IC001 Y PROCESS
IC002 C PROCESS
IC003 PAL/SECAM DISCRIMINATION
IC004 1H DELAY
IC005 REG
IC201 NTSC-PAL CONVERTER
Q001 BUFFER
Q002, 003 SWITCH
Q004, 034 SWITCH
Q006-010 PB LEVEL ADJ/LPF
Q012 NOISE CANCELLER
Q013 AMP
Q019 SWITCH
Q022 BUFFER
Q023, 025 BUFFER
Q026, 027 BUFFER
Q030 AMP
Q201, 202 SWITCH
Q204, 205 SWITCH
Q206, 213, 214 SWITCH
Q208 SWITCH
Q209, 210 SWITCH
SYNC.AGC
BEV.SET
CAR.SET
PB.LEVEL
REC.C
FL002
BL201 1HCOMB.FIL
BL001 2HCOMB.FIL
X001
X201 4.433619MHz
NO MARK:PLAY
( ):REC

- Signal path

	VIDEO Signal	
	CHROMA	Y	Y/CHROMA
REC	➡	➡➡	➡➡➡
PB	⇨	⇨⇨	⇨⇨⇨

When indicating parts by reference number, please include the board name.

NO MARK:PLAY
( ):REC

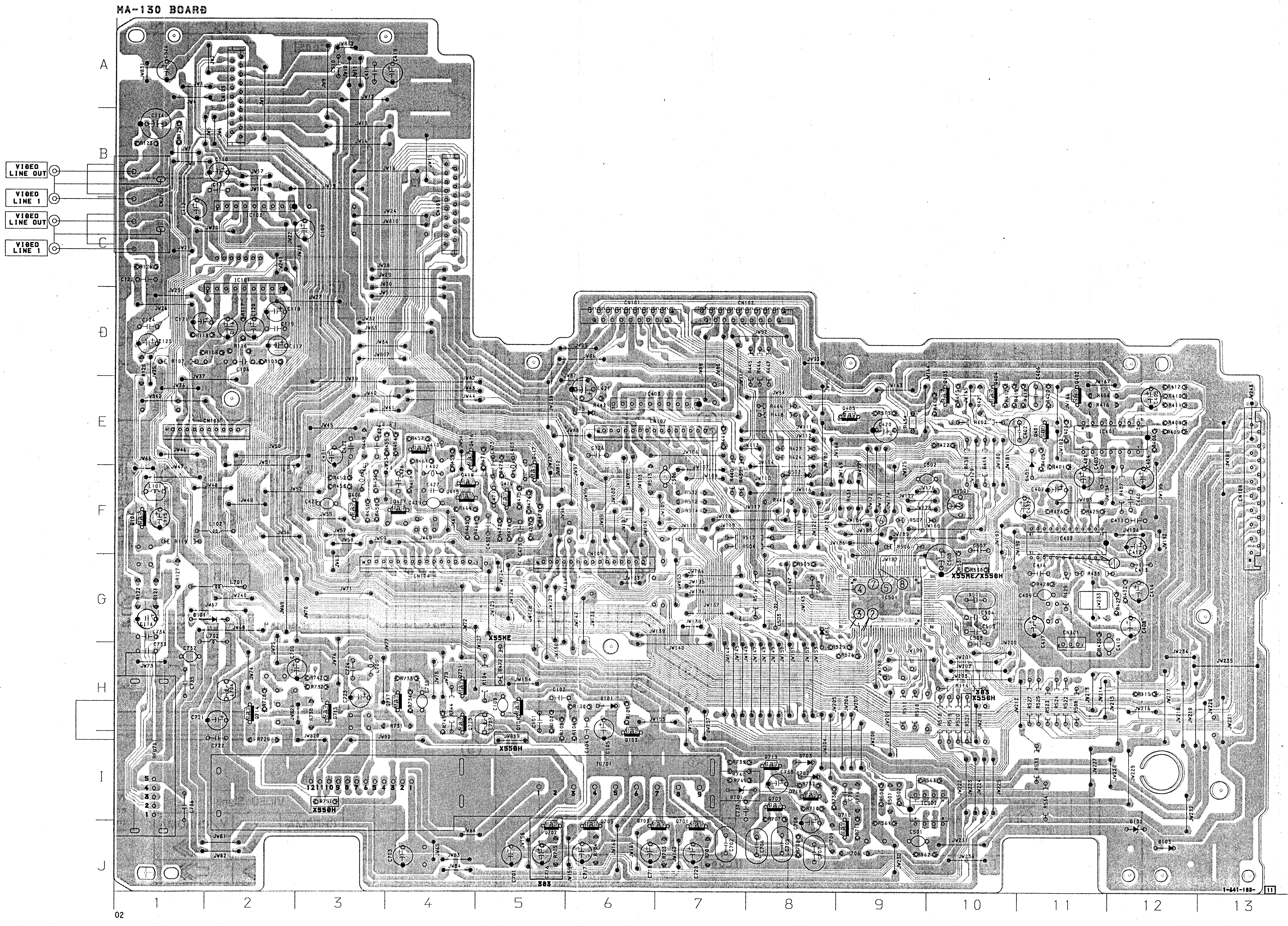
02

MA-130 (SERVO, SYSTEM CONTROL, TUNER) PRINTED WIRING BOARD

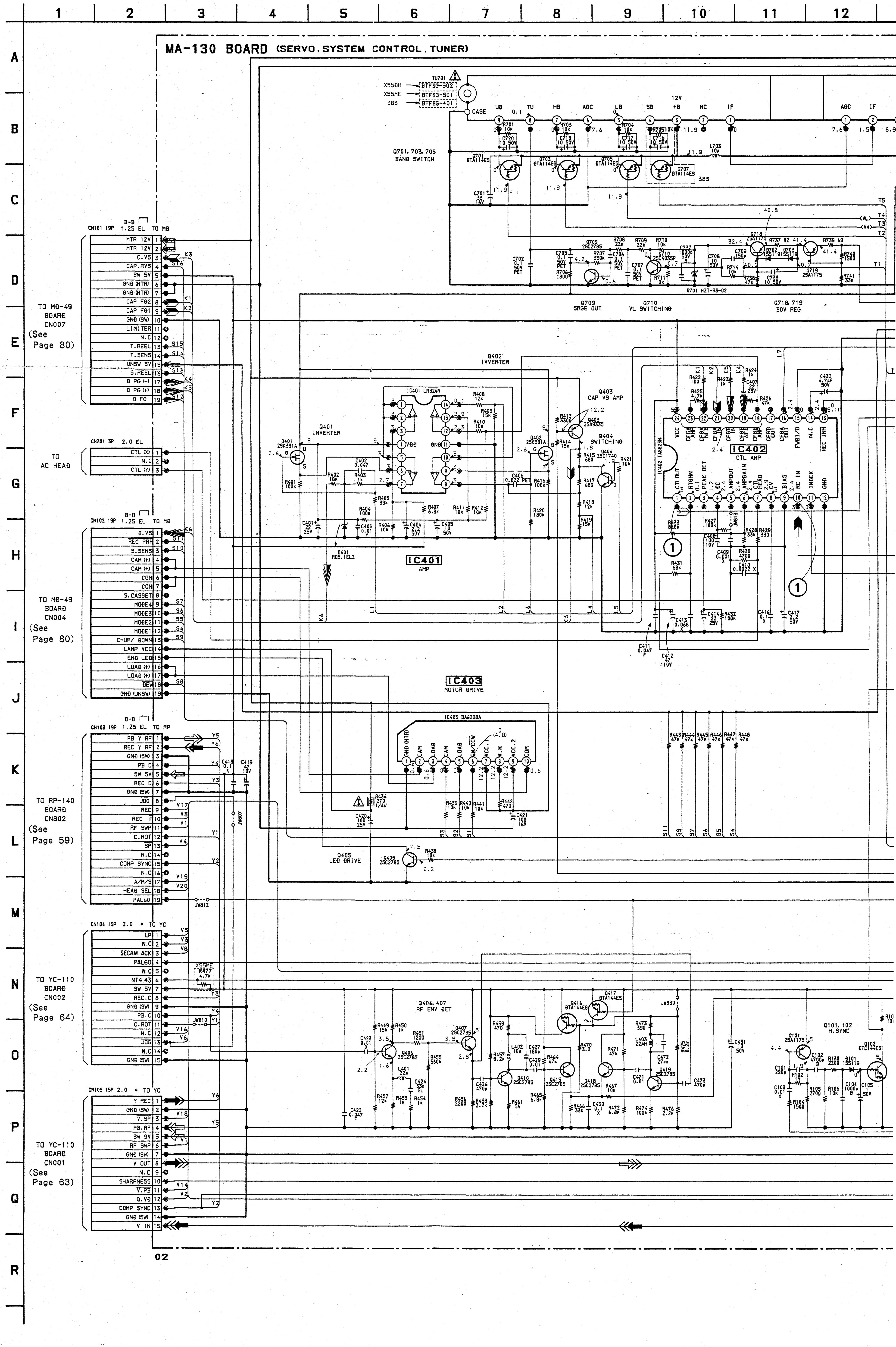
—Ref. No. MA-130 BOARD : 1,000 Series—

MA-130 BOARD

CN101	D-6
CN102	D-7
CN103	C-4
CN104	G-4
CN105	G-6
CN106	E-1
CN107	E-6
CN108	F-13
CN109	A-2
CN301	G-11
D101	H-6
D103	J-12
D401	E-11
D501	G-2
D502	F-8
D505	E-6
D506	G-8
D701	I-7
D702	I-8
D703	I-8
IC101	C-2
IC102	C-2
IC401	E-12
IC402	F-11
IC403	E-6
IC501	G-9
IC502	I-10
Q101	H-5
Q102	H-6
Q106	F-1
Q401	E-11
Q402	E-11
Q403	E-10
Q404	E-10
Q405	E-9
Q406	F-3
Q407	F-4
Q410	E-4
Q415	F-4
Q416	E-4
Q417	F-5
Q418	F-4
Q419	F-5
Q701	J-7
Q703	J-6
Q705	J-6
Q707	J-5
Q709	I-8
Q710	J-9
Q714	H-2
Q715	H-3
Q717	H-4
Q718	I-8
Q719	I-8
Q720	H-4
Q721	H-4

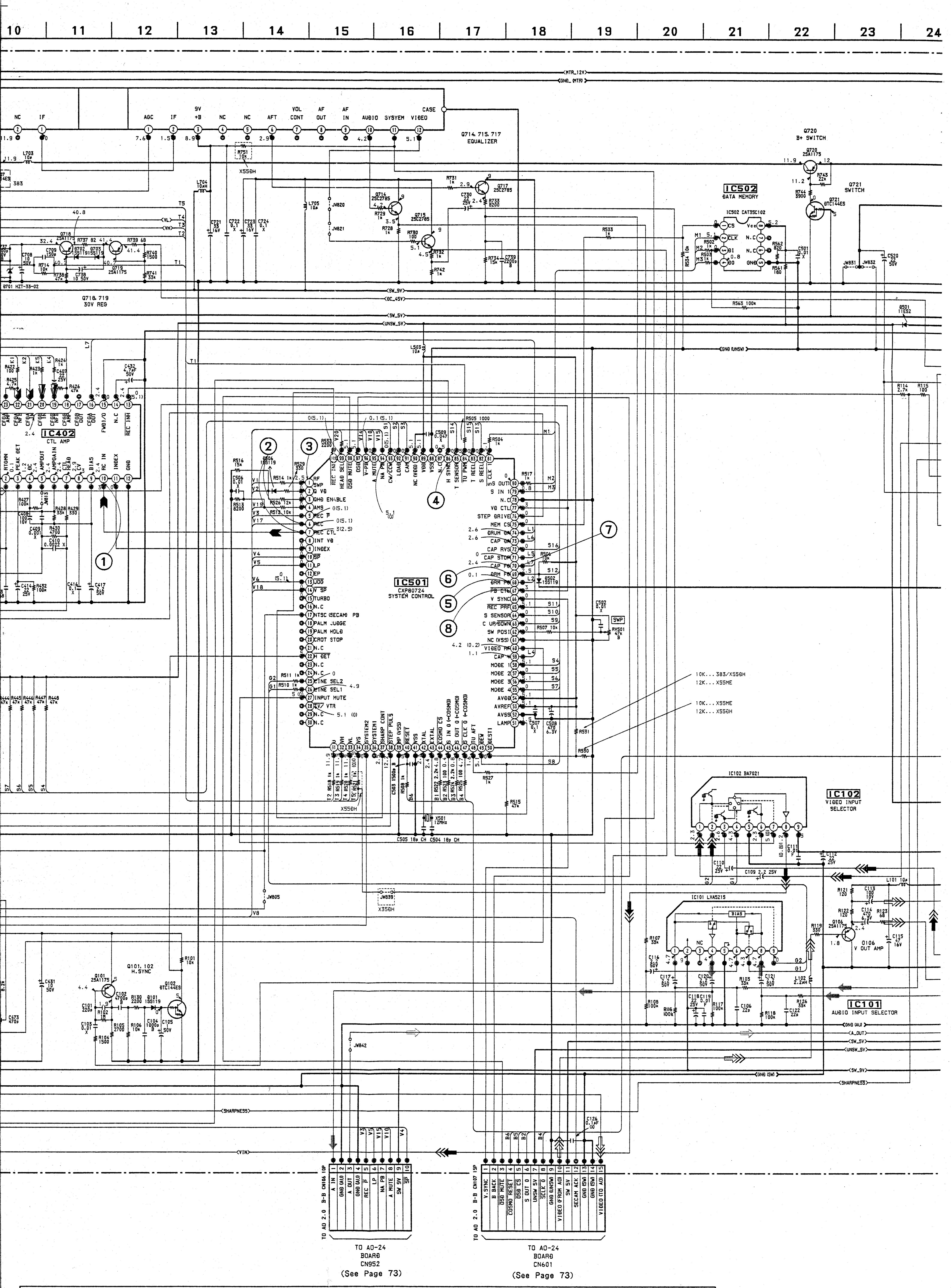

MA-130 BOARD
VIDEO LINE OUT
VIDEO LINE 1
VIDEO LINE OUT
VIDEO LINE 1
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
02
1-661-183-11
CN101
CN102
IC101
IC102
IC401
IC402
IC403
IC501
CN104
CN105
CN107
CN108
CN301
X55ME/X55BH
X55ME
X55BH
TU701

MA-130 (SERVO, SYSTEM CONTROL, TUNER) SCHEMATIC DIAGRAM —Ref. No. MA-130 BOARD : 1,000 Series—



1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
MA-130 BOARD (SERVO, SYSTEM CONTROL, TUNER)
TU701
X55DH BTF3G-502
X55ME BTF3G-501
383 BTF3G-401
CASE
UB
TU
HB
AGC
LB
SB
12V +B
NC
IF
Q701, 703, 705 BAND SWITCH
Q707
Q709 SRGE OUT
Q710 VL SWITCHING
Q718, 719 30V REG
D701 HZT-33-02
CN101 19P 1.25 EL TO MD
MTR 12V
C.VS
CAP.RVS
SW 5V
GND (MTR)
CAP FG2
CAP FG1
GND (SW)
LIMITER
N.C
T.REEL
T.SENS
UNSW 5V
S.REEL
D PG (-)
D PG (+)
D FG
TO MD-49 BOARD CN007 (See Page 80)
CN301 3P 2.0 EL
CTL (X)
CTL (Y)
TO AC HEAD
CN102 19P 1.25 EL TO MD
D.VS
REC PRF
S.SENS
CAM (+)
CAM (-)
COM
S.CASSET
MODE4
MODE3
MODE2
MODE1
C-UP/DOWN
LAMP VCC
END LED
LOAD (+)
LOAD (-)
DEW
GND (UNSW)
TO MD-49 BOARD CN004 (See Page 80)
CN103 19P 1.25 EL TO RP
PB Y RF
REC Y RF
PB C
REC C
JOG
REC
RF SWP
C.ROT
SP
COMP SYNC
A/M/S
HEAD SEL
PAL60
TO RP-140 BOARD CN802 (See Page 59)
CN104 15P 2.0 TO YC
LP
SECAM ACK
NT4.43
REC.C
PB.C
TO YC-110 BOARD CN002 (See Page 64)
CN105 15P 2.0 TO YC
Y REC
V.SP
PB.RF
SW 9V
V OUT
SHARPNESS
V.PB
Q.VD
V IN
TO YC-110 BOARD CN001 (See Page 63)
IC401 LM324N
IC401 AMP
Q401 INVERTER
Q402 IVVERTER
Q403 CAP VS AMP
Q404 SWITCHING
IC402 TA8623N
IC402 CTL AMP
IC403 MOTOR DRIVE
IC403 BA6238A
Q405 LED DRIVE
D401 RD5.1EL2
Q406, 407 RF ENV DET
Q101, 102 H.SYNC
JW807
JW810
JW812
JW830
02

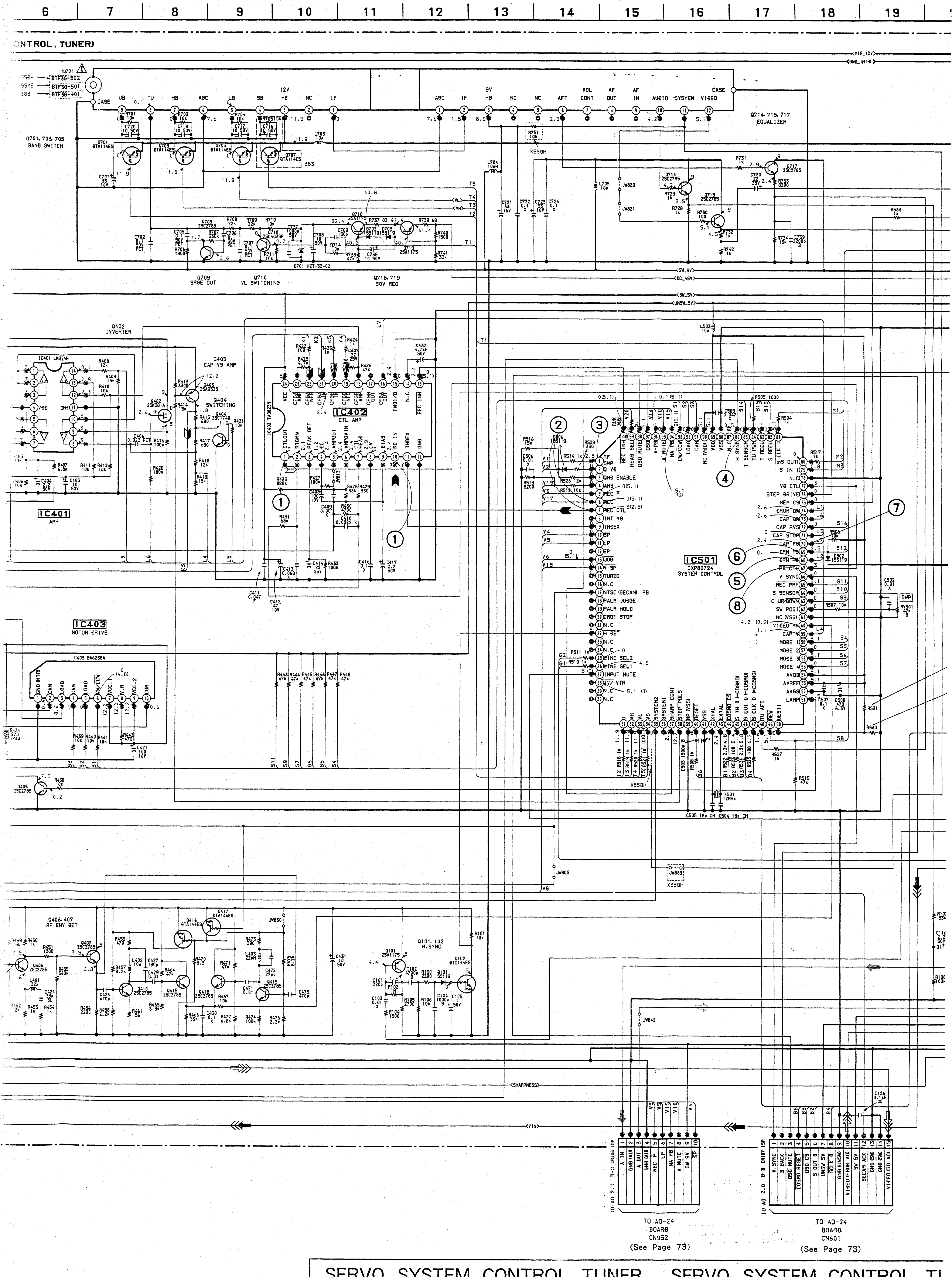
SERVO, SYSTEM


10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
MTR_12V
GND_(MTR)
NC
IF
AGC
IF
9V +B
NC
NC
AFT
VOL CONT
AF OUT
AF IN
AUDIO
SYSTEM
VIDEO
CASE
Q714, 715, 717 EQUALIZER
Q720 B+ SWITCH
Q721 SWITCH
IC502
DATA MEMORY
IC502 CAT35C102
Q718, 719 30V REG
SW_9V
DC_45V
SW_5V
UNSW_5V
GND (UNSW)
IC402
CTL AMP
IC501
CXP80724
SYSTEM CONTROL
X501 12MHz
X550H
JW805
JW839 X350H
JW842
Q101, 102 H.SYNC
IC102 BA7021
IC102
VIDEO INPUT SELECTOR
IC101 LVA5215
IC101
AUDIO INPUT SELECTOR
Q106 V OUT AMP
10K... 383/X550H
12K... X55ME
10K... X55ME
12K... X550H
SHARPNESS
VIN
GND (AU)
A_OUT
SW_5V
UNSW_5V
GND (SW)
SW_9V
SHARPNESS
B-B CN106 10P
A IN
GND (AU)
A OUT
GND (AU)
REC P
LP
NA PB
A MUTE
SW 9V
SP
B-B CN107 15P
V.SYNC
B BACK
OSD MUTE
COSMO RESET
OSD CS
S OUT 0
UNSW 5V
SCLK 0
GND (UNSW)
VIDEO (FROM AD)
SW 5V
SECAM ACK
GND (SW)
GND (SW)
VIDEO (TO AD)
TO AD 2.0
TO AD-24 BOARD CN952 (See Page 73)
TO AD-24 BOARD CN601 (See Page 73)
①
②
③
④
⑤
⑥
⑦
⑧

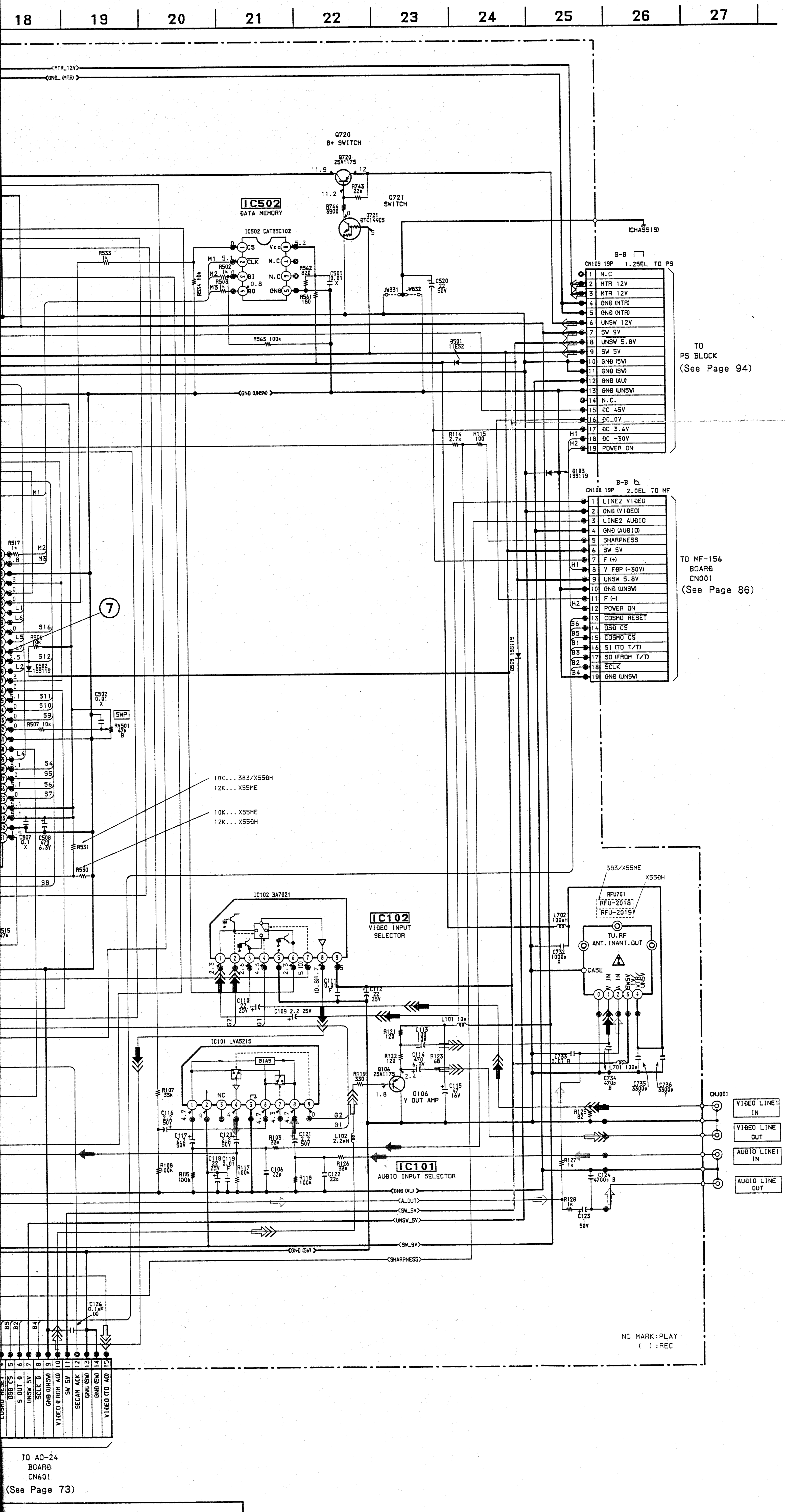
SERVO, SYSTEM CONTROL, TUNER   SERVO, SYSTEM CONTROL, TUNER

DIAGRAM —Ref. No. MA-130 BOARD : 1,000 Series—

ONTROL, TUNER)

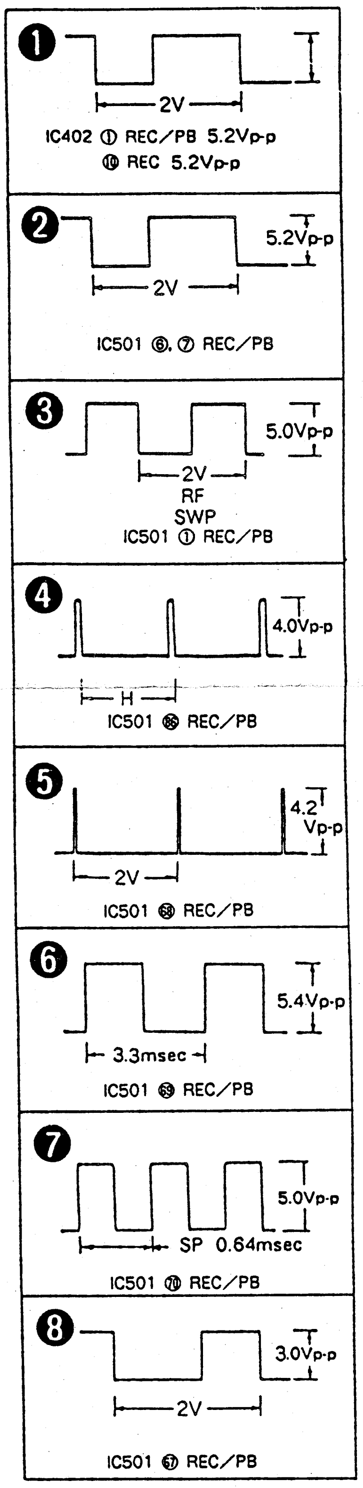

6
7
8
9
10
11
12
13
14
15
16
17
18
19
TU701
BTF5G-502
BTF5G-501
BTF5G-401
CASE
UB
TU
HB
AGC
LB
SB
12V +B
NC
IF
AGC
IF
9V +B
NC
NC
AFT
VOL CONT
AF OUT
AF IN
AUDIO
SYSYEM
VIDEO
CASE
Q701, 703, 705 BAND SWITCH
Q714, 715, 717 EQUALIZER
Q709 SAGE OUT
Q710 VL SWITCHING
Q718, 719 30V REG
X550H
Q402 IVVERTER
Q403 CAP VS AMP
Q404 SWITCHING
IC401 LM324N
IC401 AMP
IC402
CTL AMP
IC402 TA8823N
IC501
CXP80724
SYSTEM CONTROL
IC403
MOTOR DRIVE
IC403 BA6238A
Q406, 407 RF ENV DET
Q101, 102 H.SYNC
JW805
JW839
X350H
JW842
JW830
<MTR_12V>
<GND_(MTR)>
<SW_9V>
<DC_45V>
<SW_5V>
<UNSW_5V>
<SHARPNESS>
<VIN>
X501 12MHz
C505 18p CH
C504 18p CH
SWP
TO AD 2.0
B-B CN954 10P
B-B CN107 15P
A IN
GND (AU)
A OUT
GND (AU)
REC P
LP
NA PB
A MUTE
SW 9V
SP
V.SYNC
B BACK
OSD MUTE
COSMO RESET
OSD CS
S OUT 0
UNSW 5V
SCLK 0
GND (UNSW)
VIDEO (FROM AD)
SW 5V
SECAM ACK
GND (SW)
GND (SW)
VIDEO (TO AD)
TO AD-24 BOARD CN952 (See Page 73)
TO AD-24 BOARD CN601 (See Page 73)

SERVO, SYSTEM CONTROL, TUNER SERVO, SYSTEM CONTROL, TU


18
19
20
21
22
23
24
25
26
27
<MTR_12V>
<GND_(MTR)>
Q720
B+ SWITCH
Q720
2SA1175
Q721
SWITCH
Q721
DTC144ES
IC502
DATA MEMORY
IC502 CAT35C102
CS
CLK
DI
DO
Vcc
N.C
N.C
GND
R533 1k
R502
R534 10k
R562 820
R561 180
C501 0.01
C520 22 50V
JW831
JW832
(CHASSIS)
R563 100k
D501 11ES2
<GND (UNSW)>
B-B
CN109 19P 1.25EL TO PS
1 N.C
2 MTR 12V
3 MTR 12V
4 GND (MTR)
5 GND (MTR)
6 UNSW 12V
7 SW 9V
8 UNSW 5.8V
9 SW 5V
10 GND (SW)
11 GND (SW)
12 GND (AU)
13 GND (UNSW)
14 N.C.
15 DC 45V
16 DC 0V
17 DC 3.6V
18 DC -30V
19 POWER ON
TO
PS BLOCK
(See Page 94)
R114 2.7k
R115 100
D103 1SS119
B-B
CN108 19P 2.0EL TO MF
1 LINE2 VIDEO
2 GND (VIDEO)
3 LINE2 AUDIO
4 GND (AUDIO)
5 SHARPNESS
6 SW 5V
7 F (+)
8 V FOP (-30V)
9 UNSW 5.8V
10 GND (UNSW)
11 F (-)
12 POWER ON
13 COSMO RESET
14 OSD CS
15 COSMO CS
16 SI (TO T/T)
17 SO (FROM T/T)
18 SCLK
19 GND (UNSW)
TO MF-156
BOARD
CN001
(See Page 86)
D505 1SS119
R517 1k
R504 10k
D502 1SS119
R507 10k
C502 0.01
SWP
RV501 47k
R531
R530
C507 0.1
C508 470 6.3V
10K... 383/X55DH
12K... X55ME
10K... X55ME
12K... X55DH
383/X55ME
X55DH
RFU701
RFU-2018
RFU-2019
TU.RF
ANT.IN
ANT.OUT
CASE
L702 100μH
C732 1000p
IC102 BA7021
IC102
VIDEO INPUT
SELECTOR
C110 22 25V
C109 2.2 25V
C111 0.01
C112 22 25V
IC101 LVA521S
BIAS
L101 10μ
R121 120
C113 100 10V
R122 120
C114 470 6.3V
R123 68
Q106 2SA1175
Q106
V OUT AMP
R119 330
C115 47 16V
R107 33k
C116 2.2 50V
C117 2.2 50V
C120 2.2 50V
R103 33k
C121 2.2 50V
L102 2.2μH
C118 22 25V
C119 0.01
R117 100k
C106 22p
R108 100k
R116 100k
R118 100k
R126 33k
C122 22p
IC101
AUDIO INPUT SELECTOR
C733 0.01
L701 100μ
C734 470p
C735 3300p
C736 3300p
R125 82
R127 1k
C124 4700p
R128 1k
C123 50V
CNJ001
VIDEO LINE1 IN -1
VIDEO LINE OUT -2
AUDIO LINE1 IN -3
AUDIO LINE OUT -4
<GND (AU)>
<A_OUT>
<SW_5V>
<UNSW_5V>
<SW_9V>
<GND (SW)>
<SHARPNESS>
C126 0.1μF
NO MARK:PLAY
( ):REC
COSMO RESET
OSD CS
S OUT
UNSW 5V
SCLK
GND (UNSW)
VIDEO (FROM AD)
SW 5V
SECAM ACK
GND (SW)
GND (SW)
VIDEO (TO AD)
TO AD-24
BOARD
CN601
(See Page 73)

M CONTROL, TUNER

MA-130 Board


❶
2V
IC402 ① REC/PB 5.2Vp-p
⑲ REC 5.2Vp-p
❷
5.2Vp-p
2V
IC501 ⑥, ⑦ REC/PB
❸
5.0Vp-p
2V
RF
SWP
IC501 ① REC/PB
❹
4.0Vp-p
H
IC501 (86) REC/PB
❺
4.2 Vp-p
2V
IC501 (68) REC/PB
❻
5.4Vp-p
3.3msec
IC501 (69) REC/PB
❼
5.0Vp-p
SP 0.64msec
IC501 (70) REC/PB
❽
3.0Vp-p
2V
IC501 (67) REC/PB

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⮆	⮆	➡
PB	⇨	⇨	⇨	⇨

- Signal path

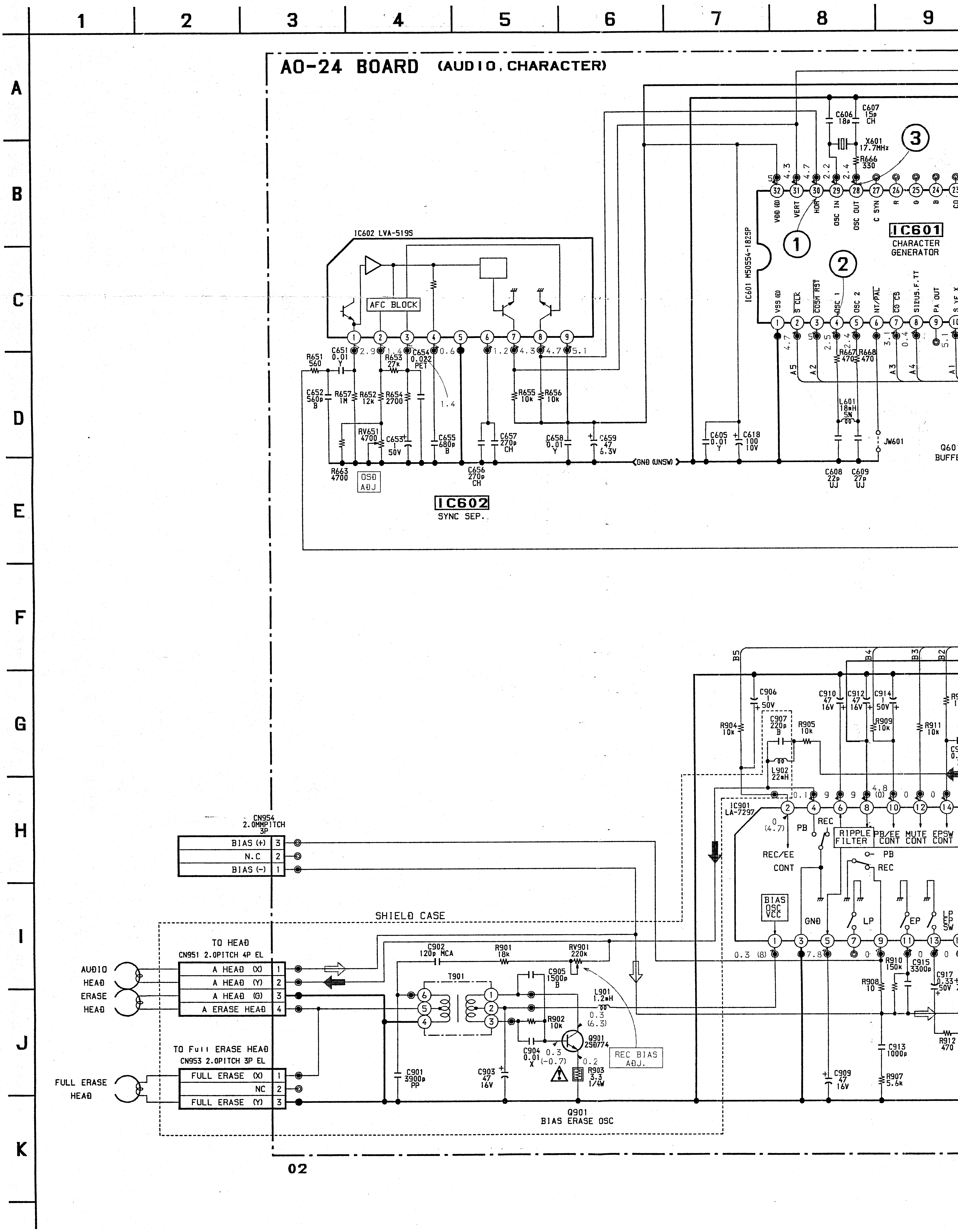
	REC	REC/
Drum speed servo		▷
Drum phase servo		⪢
Drum servo (speed and phase)		⋙
Capstan speed servo		▷
Ref. signal	➡	

When indicating parts by reference number, please include the board name.

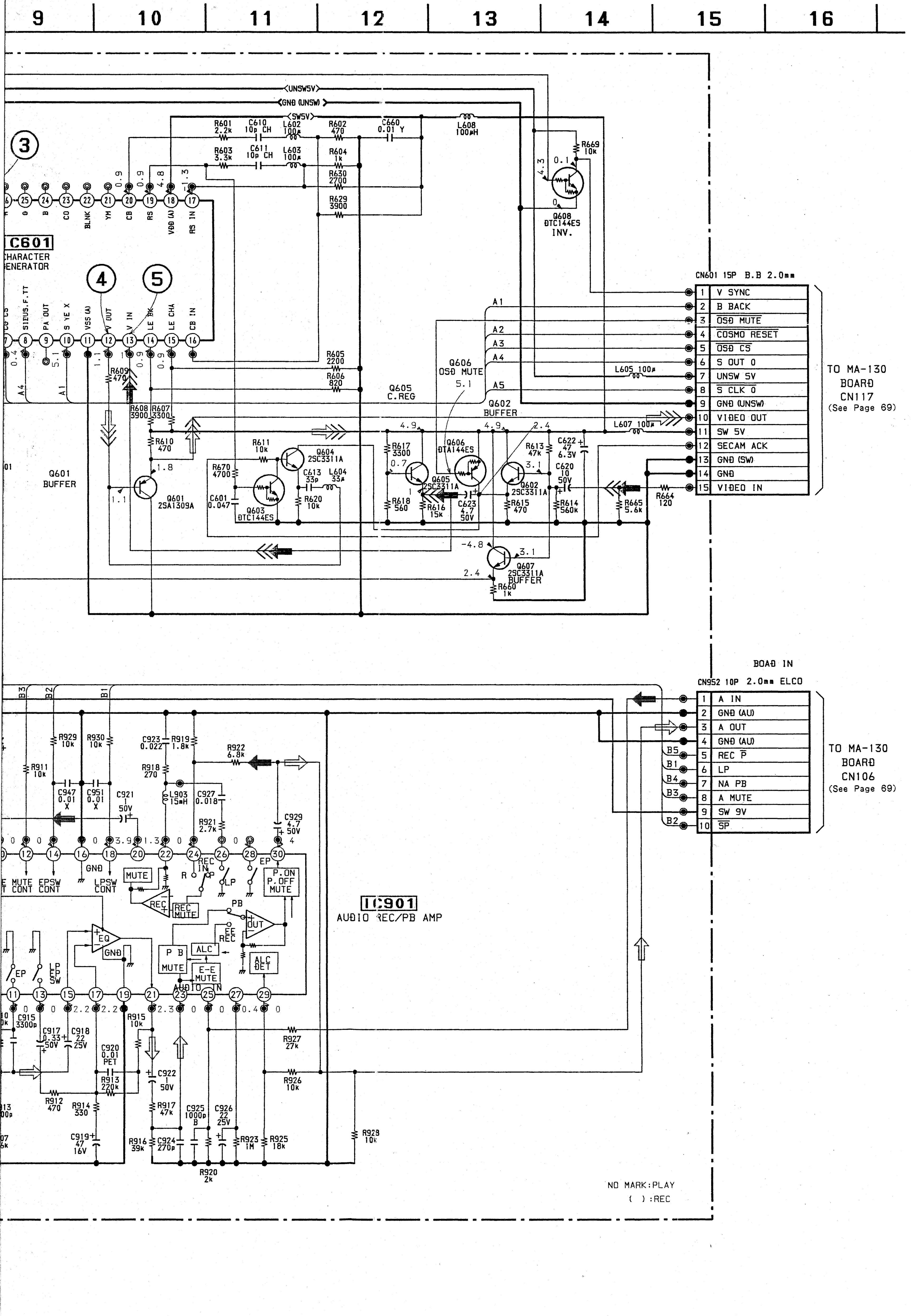
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

AO-24 (AUDIO, CHARACTER), MF-157 (SIRCS, LINE IN 2, MODE SWITCH) SCHEMATIC DIAGRAMS

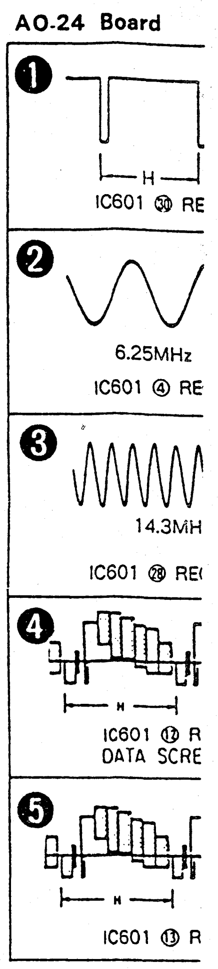
—Ref. No. AO-24 and MF-157 BOARDS : 1,000 Series—



1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
AO-24 BOARD (AUDIO, CHARACTER)
IC602 LVA-519S
AFC BLOCK
IC602
SYNC SEP.
OSD ADJ
R651 560
C651 0.01 Y
R653 27k
C654 0.022 PET
C652 560p B
R657 1M
R652 12k
R654 2700
RV651 4700
C653 1 50V
R663 4700
C655 680p B
C656 270p CH
C657 270p CH
R655 10k
R656 10k
C658 0.01 Y
C659 47 6.3V
GND (UNSW)
C605 0.01 Y
C618 100 10V
C606 18p
C607 15p CH
X601 17.7MHz
R666 330
IC601 M50554-182SP
IC601
CHARACTER GENERATOR
VDD (5)
VERT
HOR
OSC IN
OSC OUT
C SYN
R
G
B
VSS (0)
S CLK
COSM RST
OSC 1
OSC 2
NT/PAL
CG CS
SIEUS.F.TT
PA OUT
R667 470
R668 470
L601 18mH 5%
C608 22p UJ
C609 27p UJ
JW601
Q60
BUFFE
①
②
③
A5
A2
A3
A4
A1
B5
B4
B3
B2
C906 1 50V
R904 10k
C907 220p B
R905 10k
L902 22mH
C910 47 16V
C912 47 16V
C914 1 50V
R909 10k
R911 10k
IC901 LA-7297
REC/EE CONT
PB
REC
RIPPLE FILTER
PB/EE CONT
MUTE CONT
EPSW CONT
BIAS OSC VCC
GND
LP
EP
R910 150k
C915 3300p
C917 0.33 50V
R908 10
C913 1000p
R912 470
C909 47 16V
R907 5.6k
CN954 2.0MMPITCH 3P
BIAS (+)
N.C
BIAS (−)
SHIELD CASE
TO HEAD
CN951 2.0PITCH 4P EL
A HEAD (X)
A HEAD (Y)
A HEAD (G)
A ERASE HEAD
AUDIO HEAD
ERASE HEAD
TO Full ERASE HEAD
CN953 2.0PITCH 3P EL
FULL ERASE (X)
NC
FULL ERASE (Y)
FULL ERASE HEAD
C902 120p MCA
R901 18k
RV901 220k
T901
C905 1500p B
L901 1.2mH
R902 10k
Q901 2SD774
C904 0.01 X
C901 3900p PP
C903 47 16V
R903 3.3 1/4W
REC BIAS ADJ.
Q901
BIAS ERASE OSC
02



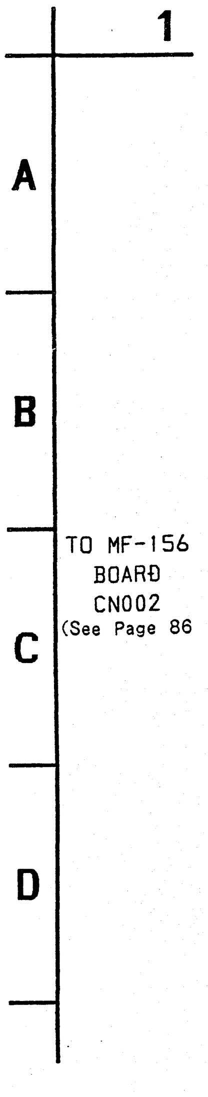
9
10
11
12
13
14
15
16
<UNSW5V>
<GND (UNSW)>
<SW5V>
③
④
⑤
IC601
CHARACTER GENERATOR
R601 2.2k
C610 10p CH
L602 100μ
R602 470
C660 0.01 Y
L608 100μH
R603 3.3k
C611 10p CH
L603 100μ
R604 1k
R630 2700
R629 3900
R669 10k
Q608 DTC144ES INV.
VDD (A)
RS IN
BLNK
YM
CB
RS
CO
VSS (A)
V OUT
V IN
LE BK
LE CHA
CB IN
PA OUT
S YE X
R605 2200
R606 820
R609 470
R608 3900
R607 3300
R610 470
Q601 BUFFER
Q601 2SA1309A
R670 4700
C601 0.047
Q603 DTC144ES
R611 10k
Q604 2SC3311A
C613 33p
L604 33μ
R620 10k
Q605 C.REG
Q606 OSD MUTE
Q606 DTA144ES
R617 3300
R618 560
R616 15k
Q605 2SC3311A
C623 4.7 50V
Q602 BUFFER
R613 47k
Q602 2SC3311A
R615 470
C622 47 6.3V
C620 10 50V
R614 560k
R665 5.6k
R664 120
L605 100μ
L607 100μ
Q607 2SC3311A BUFFER
R660 1k
A1
A2
A3
A4
A5
CN601 15P B.B 2.0mm
1 V SYNC
2 B BACK
3 OSD MUTE
4 COSMO RESET
5 OSD CS
6 S OUT 0
7 UNSW 5V
8 S CLK 0
9 GND (UNSW)
10 VIDEO OUT
11 SW 5V
12 SECAM ACK
13 GND (SW)
14 GND
15 VIDEO IN
TO MA-130 BOARD CN117 (See Page 69)
BOAD IN
CN952 10P 2.0mm ELCO
1 A IN
2 GND (AU)
3 A OUT
4 GND (AU)
5 REC P
6 LP
7 NA PB
8 A MUTE
9 SW 9V
10 SP
TO MA-130 BOARD CN106 (See Page 69)
B1
B2
B3
B4
B5
R929 10k
R930 10k
R911 10k
C947 0.01
C951 0.01
C921 1 50V
C923 0.022
R919 1.8k
R918 270
L903 15mH
C927 0.018
R922 6.8k
R921 2.7k
C929 4.7 50V
IC901
AUDIO REC/PB AMP
MUTE CONT
EPSW CONT
LPSW CONT
GND
MUTE
REC IN
REC
REC MUTE
EP
LP
PB
P.ON P.OFF MUTE
OUT
EE REC
EQ
P B MUTE
ALC
E-E MUTE
ALC DET
AUDIO IN
LP EP SW
C915 3300p
C917 0.33 50V
C918 22 25V
C920 0.01 PET
R915 10k
R913 220k
R912 470
R914 330
C919 47 16V
C922 1 50V
R917 47k
C925 1000p B
C926 22 25V
R916 39k
C924 270p
R923 1M
R925 18k
R920 2k
R927 27k
R926 10k
R928 10k
NO MARK:PLAY
( ):REC



AO-24 Board
❶
H
IC601 ㉚ RE
❷
6.25MHz
IC601 ④ RE
❸
14.3MH
IC601 ⑳ RE
❹
H
IC601 ⑫ R
DATA SCRE
❺
H
IC601 ⑬ R

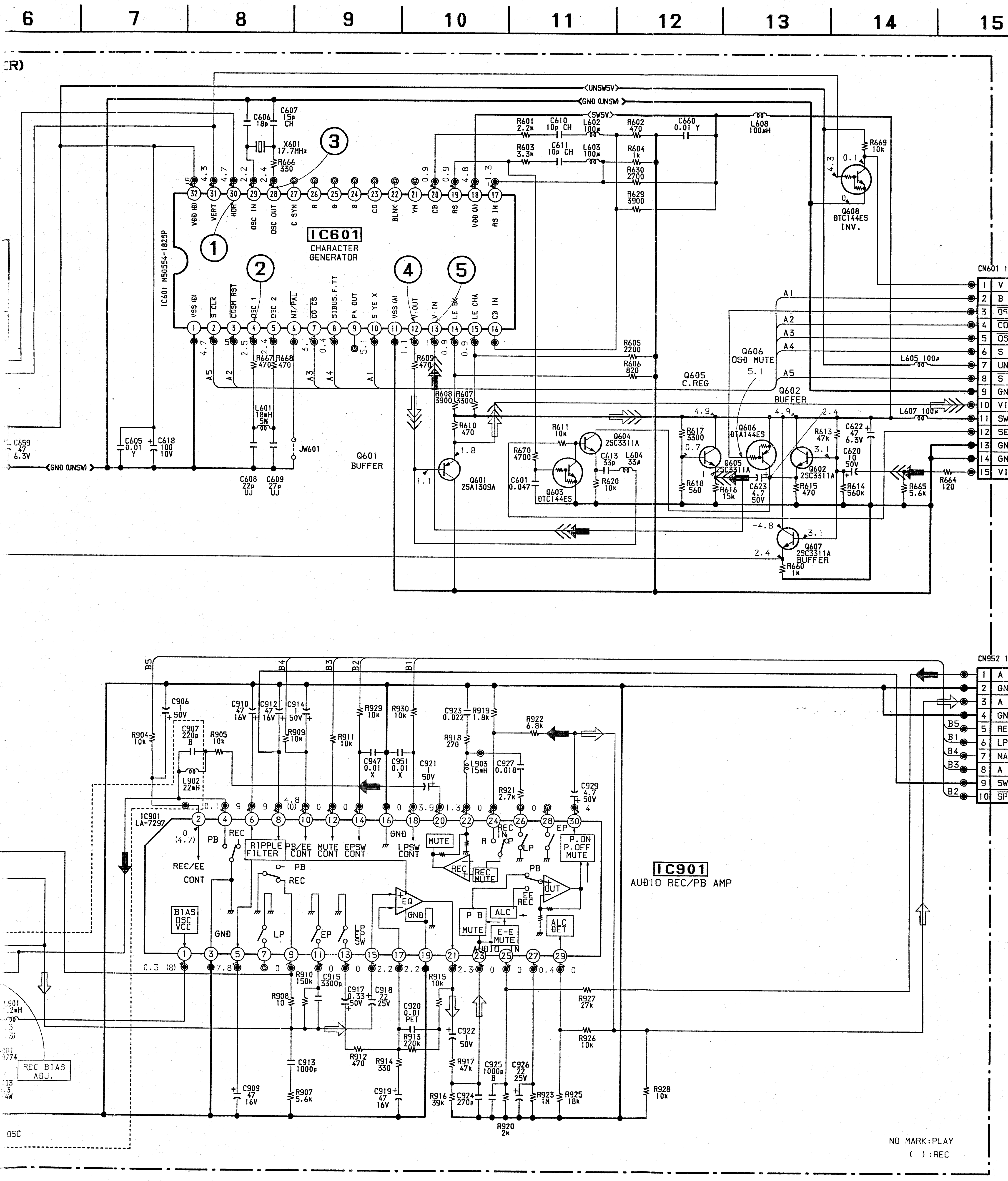
- Signal path

	AUDIO Si
REC	➡
PB	⇨

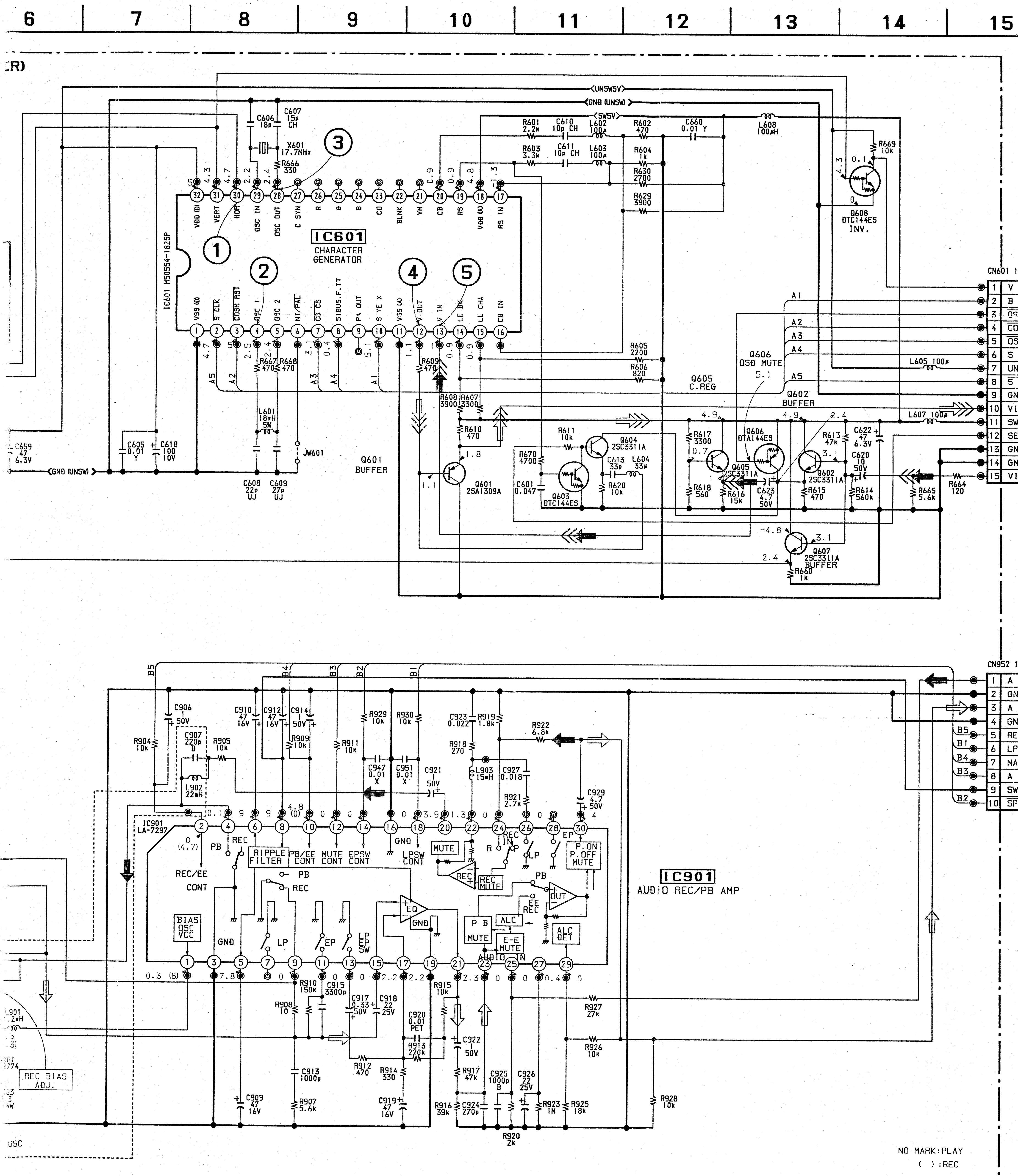


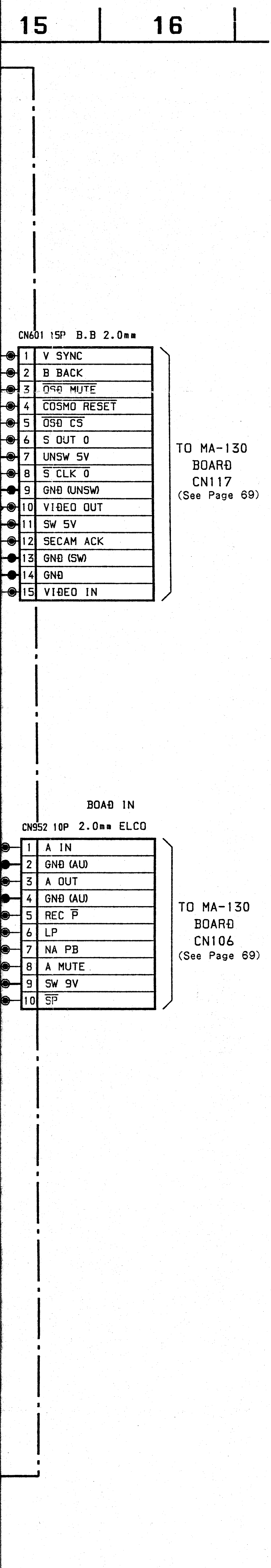
1
A
B
C
D
TO MF-156 BOARD CN002 (See Page 86

AUDIO, SIRCS A

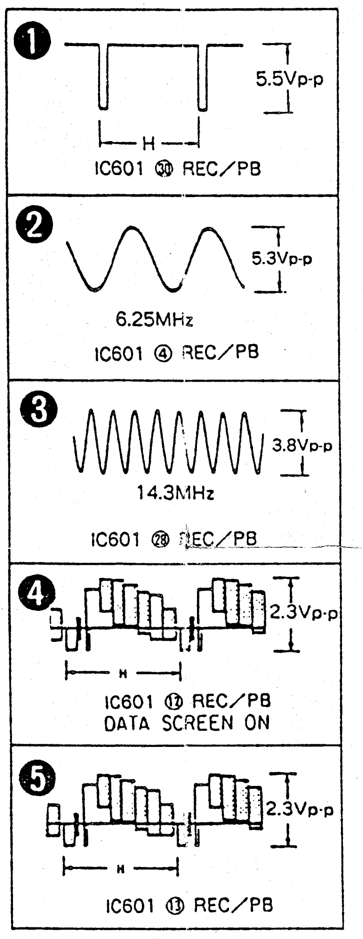

6
7
8
9
10
11
12
13
14
15
IC601
CHARACTER GENERATOR
IC601 M50554-182SP
Q601 BUFFER
Q601 2SA1309A
Q602 BUFFER
Q602 2SC3311A
Q603 DTC144ES
Q604 2SC3311A
Q605 C.REG
Q605 2SC3311A
Q606 OSD MUTE
Q606 DTA144ES
Q607 2SC3311A BUFFER
Q608 DTC144ES INV.
X601 17.7MHz
(UNSW5V)
GND (UNSW)
(SW5V)
JW601
CN601
CN952
IC901
AUDIO REC/PB AMP
IC901 LA-7297
RIPPLE FILTER
PB/EE CONT
MUTE CONT
EPSW CONT
LPSW CONT
REC/EE CONT
BIAS OSC VCC
EQ
MUTE
REC MUTE
P.ON P.OFF MUTE
OUT
ALC
ALC DET
P B MUTE
E-E MUTE
AUDIO IN
REC BIAS ADJ.
OSC

NO MARK:PLAY
( ) :REC


6
7
8
9
10
11
12
13
14
15
IC601
CHARACTER GENERATOR
IC601 M50554-182SP
X601 17.7MHz
Q601 BUFFER
Q601 2SA1309A
Q603 DTC144ES
Q604 2SC3311A
Q605 C.REG
Q605 2SC3311A
Q606 OSD MUTE
Q606 DTA144ES
Q602 BUFFER
Q602 2SC3311A
Q607 2SC3311A BUFFER
Q608 DTC144ES INV.
CN601
CN952
<UNSW5V>
<GND (UNSW)>
<SW5V>
IC901 LA-7297
IC901
AUDIO REC/PB AMP
RIPPLE FILTER
PB/EE CONT
MUTE CONT
EPSW CONT
LPSW CONT
REC/EE CONT
BIAS OSC VCC
EQ
ALC
ALC DET
P.ON P.OFF MUTE
REC MUTE
E-E MUTE
AUDIO IN
REC BIAS ADJ.
NO MARK:PLAY
( ):REC


15
16
CN601 15P B.B 2.0mm
1 V SYNC
2 B BACK
3 OSD MUTE
4 COSMO RESET
5 OSD CS
6 S OUT 0
7 UNSW 5V
8 S CLK 0
9 GND (UNSW)
10 VIDEO OUT
11 SW 5V
12 SECAM ACK
13 GND (SW)
14 GND
15 VIDEO IN
TO MA-130
BOARD
CN117
(See Page 69)
BOAD IN
CN952 10P 2.0mm ELCO
1 A IN
2 GND (AU)
3 A OUT
4 GND (AU)
5 REC P
6 LP
7 NA PB
8 A MUTE
9 SW 9V
10 SP
TO MA-130
BOARD
CN106
(See Page 69)

AO-24 Board

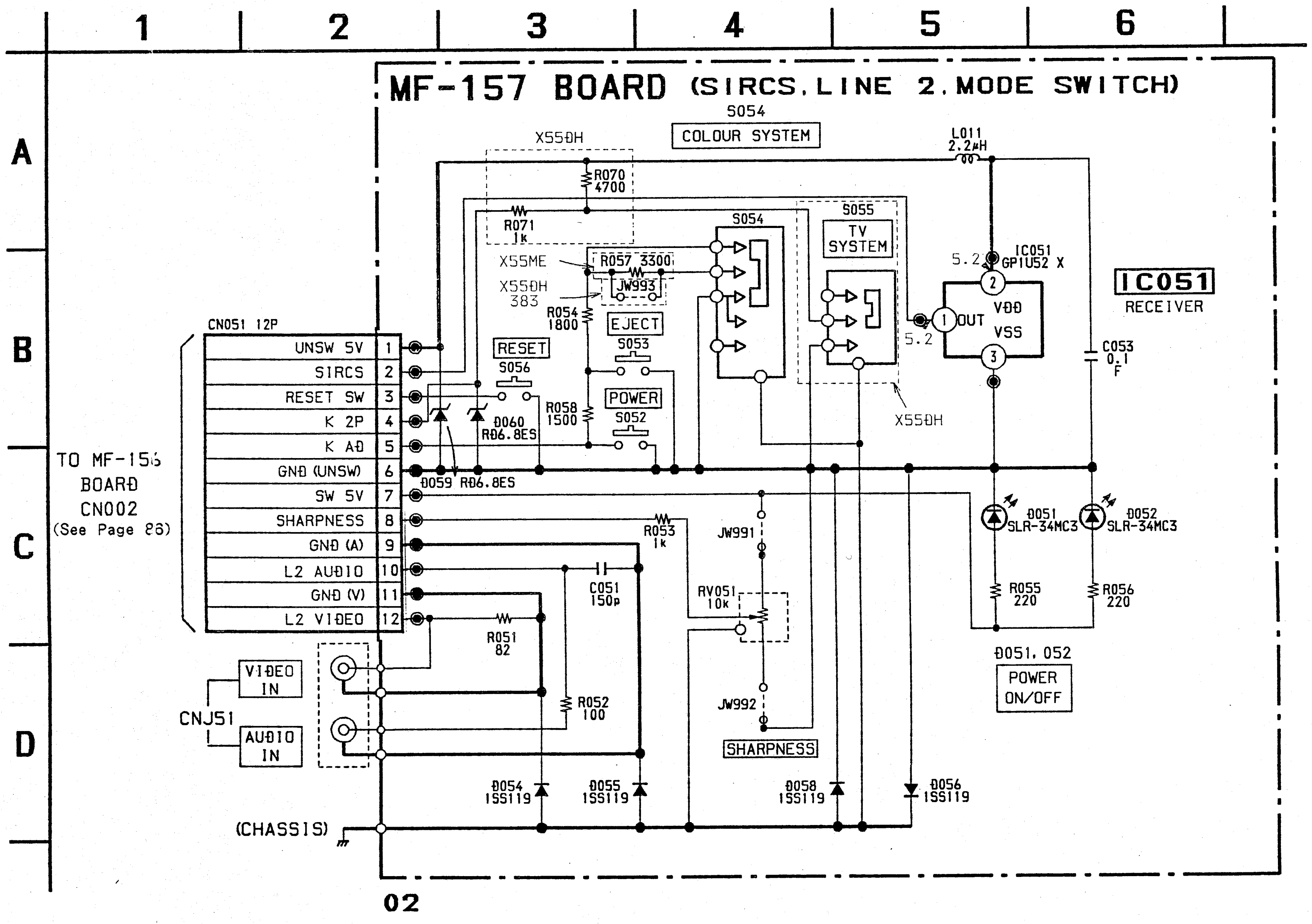

❶
5.5Vp-p
H
IC601 ㉚ REC/PB
❷
5.3Vp-p
6.25MHz
IC601 ④ REC/PB
❸
3.8Vp-p
14.3MHz
IC601 ㉘ REC/PB
❹
2.3Vp-p
H
IC601 ⑰ REC/PB
DATA SCREEN ON
❺
2.3Vp-p
H
IC601 ⑬ REC/PB

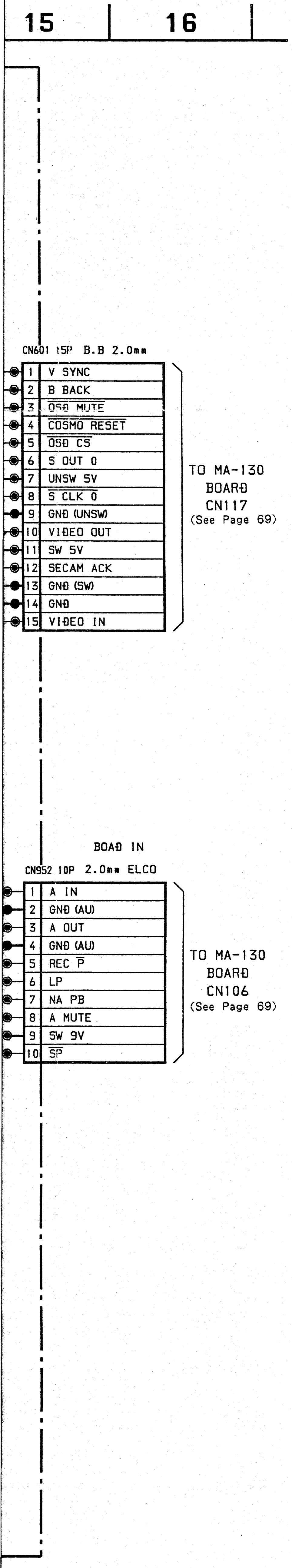
- Signal path

	AUDIO Signal	VIDEO Signal
		Y/CHROMA
REC	➡	➡≫
PB	⇨	⇨≫

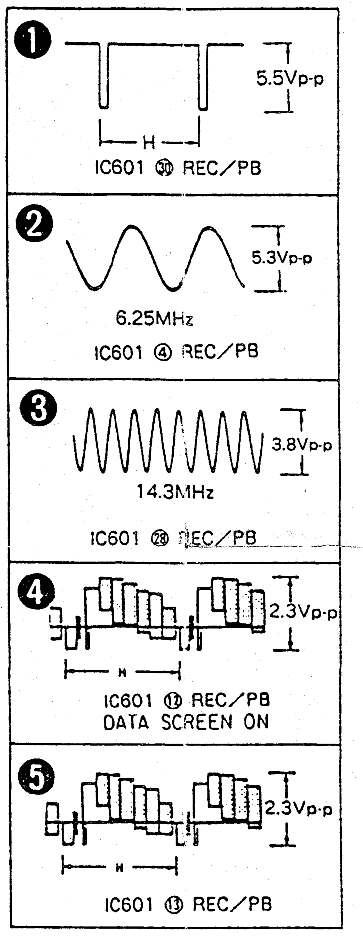
When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.


1
2
3
4
5
6
A
B
C
D
MF-157 BOARD (SIRCS, LINE 2, MODE SWITCH)
X55DH
R070 4700
R071 1k
X55ME
R057 3300
X55DH 383
JW993
R054 1800
EJECT
S053
RESET
S056
POWER
S052
R058 1500
D060 RD6.8ES
D059 RD6.8ES
S054
COLOUR SYSTEM
S054
S055
TV SYSTEM
X55DH
L011 2.2μH
5.2
IC051 GP1U52 X
OUT
VDD
VSS
5.2
IC051
RECEIVER
C053 0.1 F
D051 SLR-34MC3
D052 SLR-34MC3
R055 220
R056 220
D051, 052
POWER ON/OFF
CN051 12P
UNSW 5V 1
SIRCS 2
RESET SW 3
K 2P 4
K AD 5
GND (UNSW) 6
SW 5V 7
SHARPNESS 8
GND (A) 9
L2 AUDIO 10
GND (V) 11
L2 VIDEO 12
TO MF-156
BOARD
CN002
(See Page 86)
R053 1k
JW991
C051 150p
RV051 10k
R051 82
R052 100
JW992
SHARPNESS
VIDEO IN
CNJ51
AUDIO IN
D054 1SS119
D055 1SS119
D058 1SS119
D056 1SS119
(CHASSIS)
02


15
16
CN601 15P B.B 2.0mm
1 V SYNC
2 B BACK
3 OSD MUTE
4 COSMO RESET
5 OSD CS
6 S OUT 0
7 UNSW 5V
8 S CLK 0
9 GND (UNSW)
10 VIDEO OUT
11 SW 5V
12 SECAM ACK
13 GND (SW)
14 GND
15 VIDEO IN
TO MA-130
BOARD
CN117
(See Page 69)
BOAD IN
CN952 10P 2.0mm ELCO
1 A IN
2 GND (AU)
3 A OUT
4 GND (AU)
5 REC P
6 LP
7 NA PB
8 A MUTE
9 SW 9V
10 SP
TO MA-130
BOARD
CN106
(See Page 69)

AO-24 Board

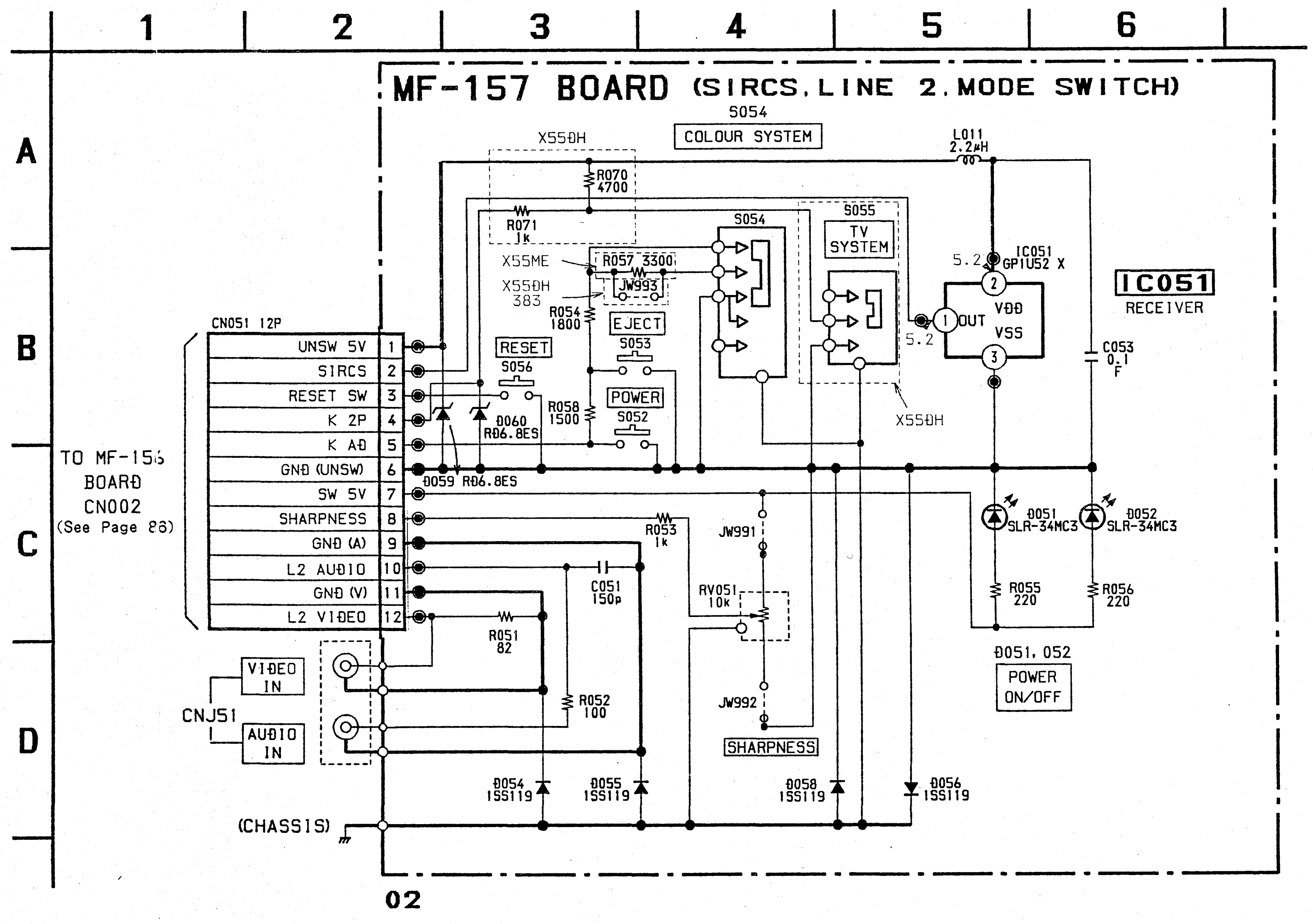

❶
5.5Vp-p
H
IC601 ㊿ REC/PB
❷
5.3Vp-p
6.25MHz
IC601 ④ REC/PB
❸
3.8Vp-p
14.3MHz
IC601 ㉘ REC/PB
❹
2.3Vp-p
H
IC601 ⑪ REC/PB
DATA SCREEN ON
❺
2.3Vp-p
H
IC601 ⑪ REC/PB

- Signal path

	AUDIO Signal	VIDEO Signal
		Y/CHROMA
REC	➡	➡⋙
PB	⇨	⇨⋙

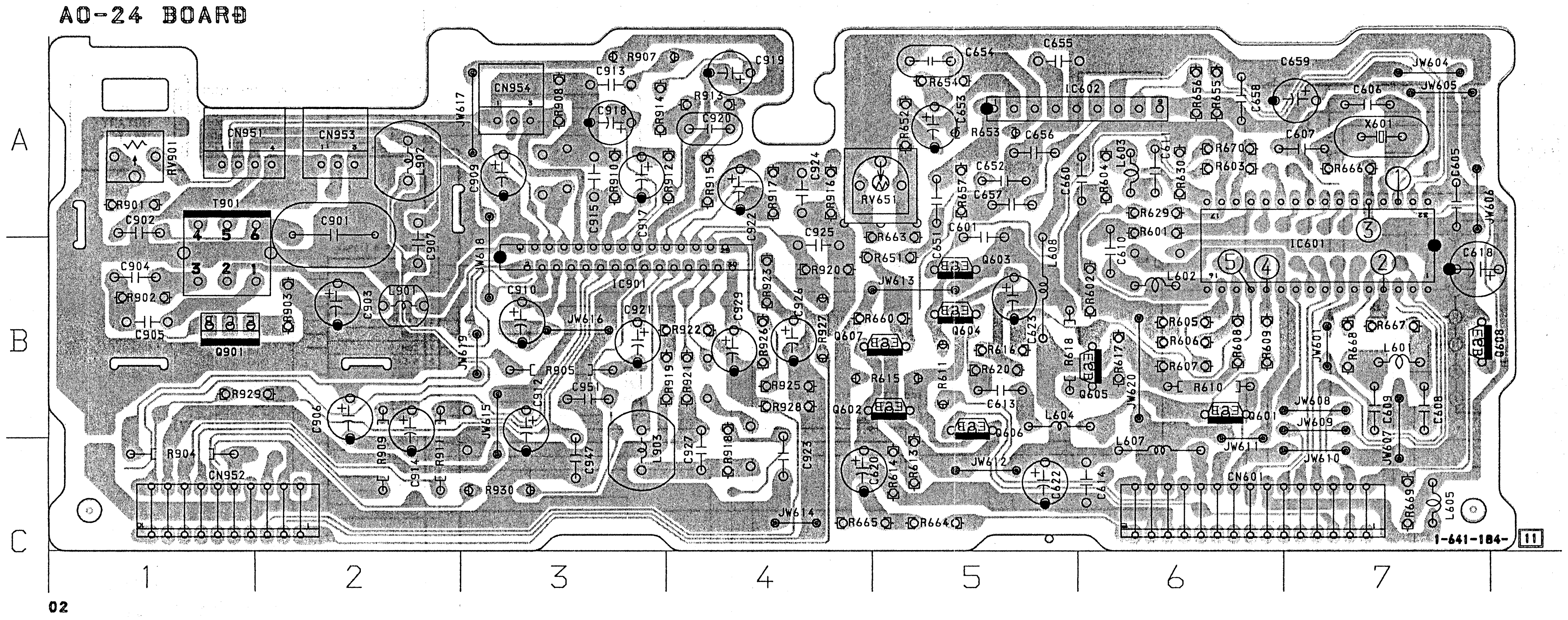
When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.


1
2
3
4
5
6
A
B
C
D
MF-157 BOARD (SIRCS, LINE 2, MODE SWITCH)
S054
COLOUR SYSTEM
X55DH
R070 4700
R071 1k
L011 2.2μH
S054
S055 TV SYSTEM
X55ME
R057 3300
X55DH 383
JW993
R054 1800
EJECT S053
RESET S056
POWER S052
R058 1500
D060 RD6.8ES
D059 RD6.8ES
5.2
IC051 GP1U52 X
IC051 RECEIVER
OUT
VDD
VSS
C053 0.1 F
X55DH
CN051 12P
UNSW 5V 1
SIRCS 2
RESET SW 3
K 2P 4
K AD 5
GND (UNSW) 6
SW 5V 7
SHARPNESS 8
GND (A) 9
L2 AUDIO 10
GND (V) 11
L2 VIDEO 12
TO MF-156
BOARD
CN002
(See Page 86)
R053 1k
JW991
RV051 10k
C051 150p
R051 82
R052 100
JW992
SHARPNESS
D051 SLR-34MC3
D052 SLR-34MC3
R055 220
R056 220
D051, 052
POWER ON/OFF
VIDEO IN
AUDIO IN
CNJ51
(CHASSIS)
D054 1SS119
D055 1SS119
D058 1SS119
D056 1SS119
02

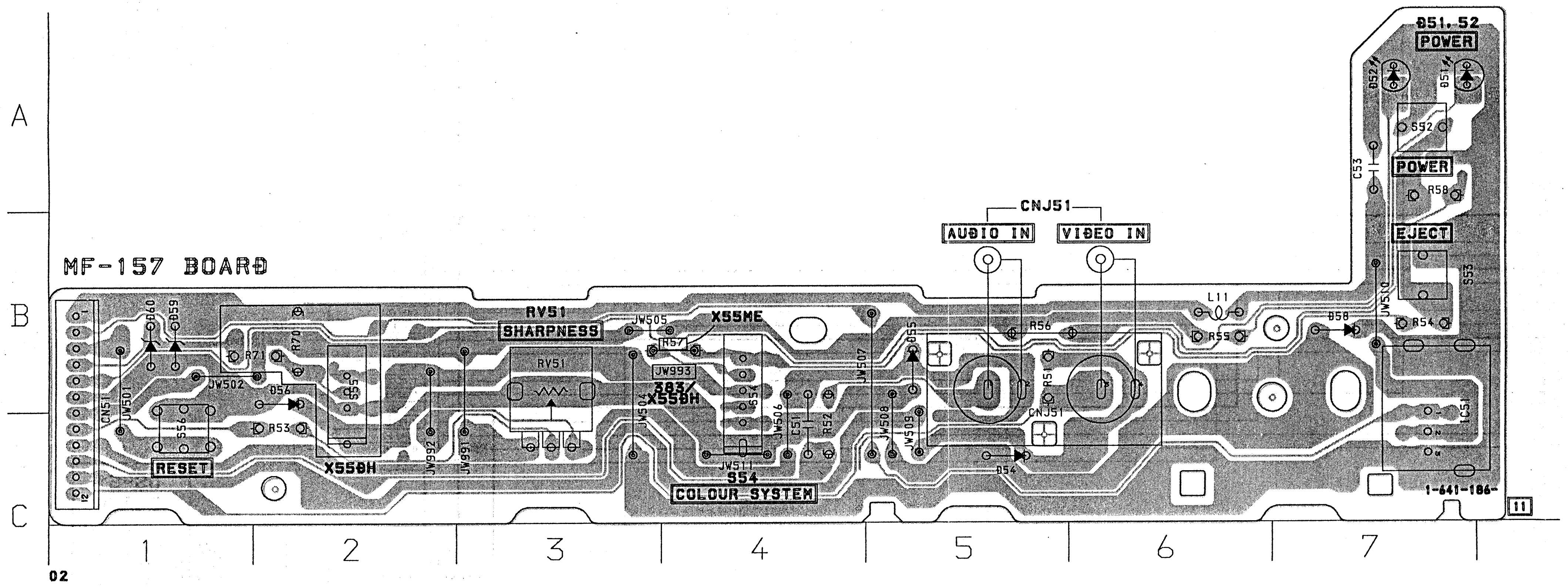
AO-24 (AUDIO, CHARACTER), MF-157 (SIRCS, LINE IN 2, MODE SWITCH) PRINTED WIRING BOARDS

—Ref. No. AO-24 and MF-157 BOARDS : 1,000 Series—


AO-24 BOARD
A
B
C
1
2
3
4
5
6
7
02
CN951
CN953
CN954
CN952
CN601
T901
Q901
RV901
RV651
IC901
IC601
IC602
X601
1-641-184-
11

AO-24 BOARD

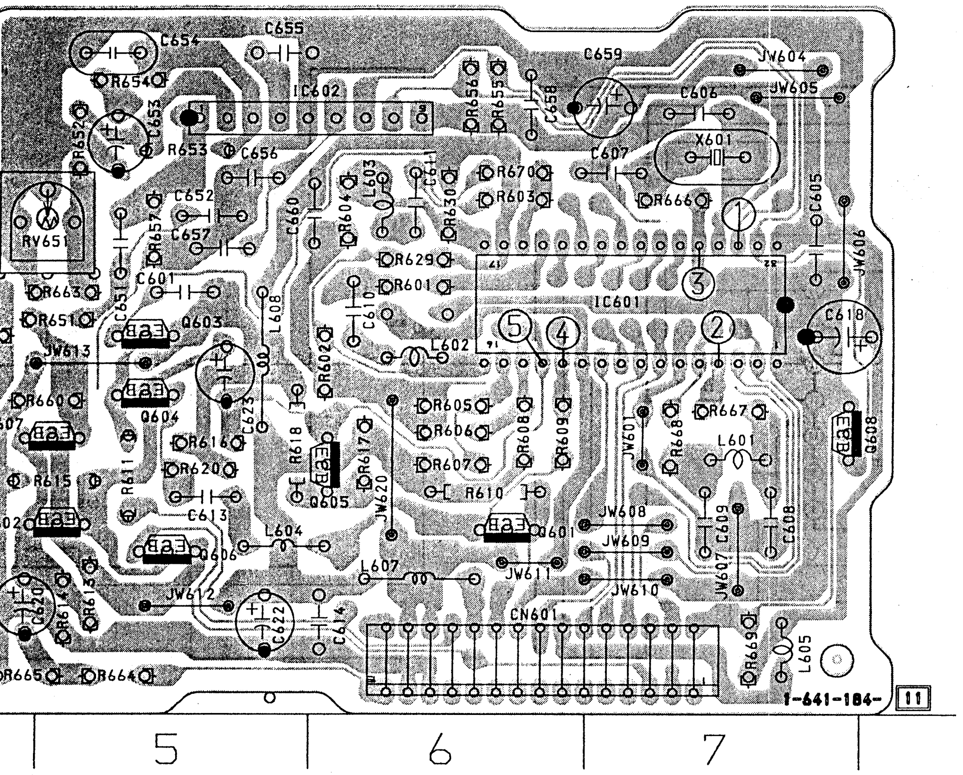
CN601	C-6
CN951	A-1
CN952	C-1
CN953	A-2
CN954	A-3
IC601	B-7
IC602	A-5
IC901	B-3
Q601	B-6
Q602	B-5
Q603	B-5
Q604	B-5
Q605	B-6
Q606	B-5
Q607	B-5
Q608	B-7
Q901	B-1


MF-157 BOARD
A
B
C
1
2
3
4
5
6
7
02
D51, 52
POWER
S52
POWER
R58
EJECT
S53
CNJ51
AUDIO IN
VIDEO IN
RV51
SHARPNESS
X55ME
JW993
S83/X55BH
RESET
X55BH
S54
COLOUR SYSTEM
CN51
IC51
L11
1-641-186-
11

MF-157 BOARD

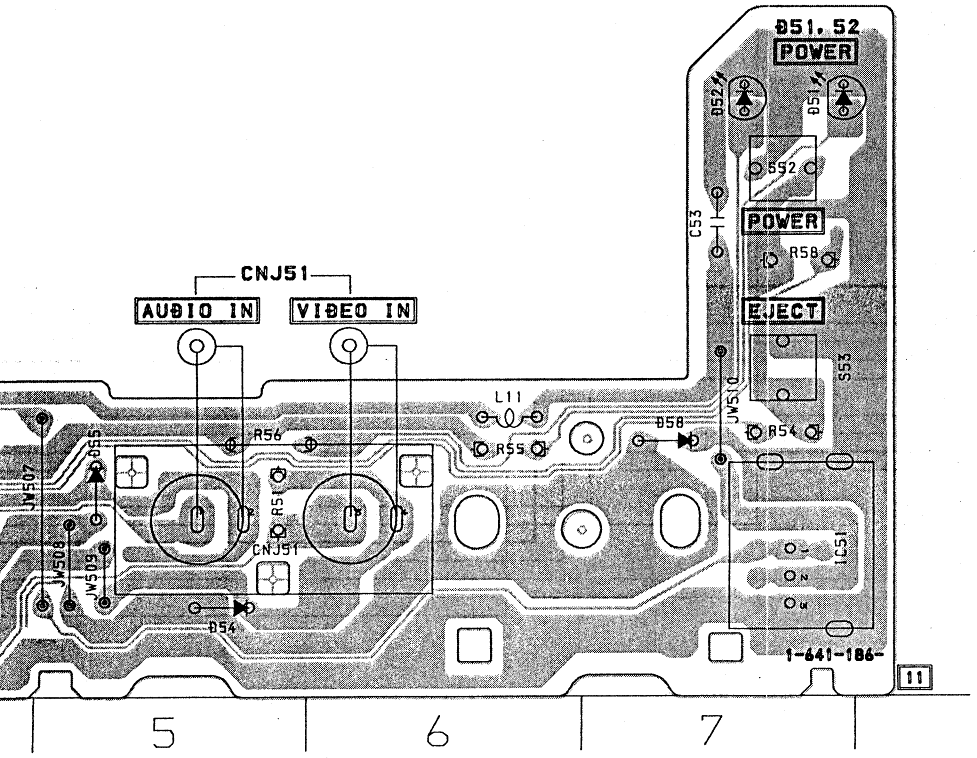
CN051	B-1
D051	A-7
D052	A-7
D054	C-5
D055	B-5
D058	B-7
D059	B-1
D060	B-1
IC051	C-7

TED WIRING BOARDS


IC602
IC601
X601
RV651
CN601
JW604
JW605
Q601
Q603
Q604
Q605
Q606
Q608
L601
L602
L604
L605
L607
L608
1-641-184-
11
5
6
7

AO-24 BOARD

CN601	C-6
CN951	A-1
CN952	C-1
CN953	A-2
CN954	A-3
IC601	B-7
IC602	A-5
IC901	B-3
Q601	B-6
Q602	B-5
Q603	B-5
Q604	B-5
Q605	B-6
Q606	B-5
Q607	B-5
Q608	B-7
Q901	B-1


D51, 52
POWER
POWER
EJECT
CNJ51
AUDIO IN
VIDEO IN
D52
D51
S52
C53
R58
S53
L11
R55
D58
R54
R56
R57
D55
D54
IC51
JW507
JW508
JW509
JW510
CNJ51
1-641-186-
11
5
6
7

MF-157 BOARD

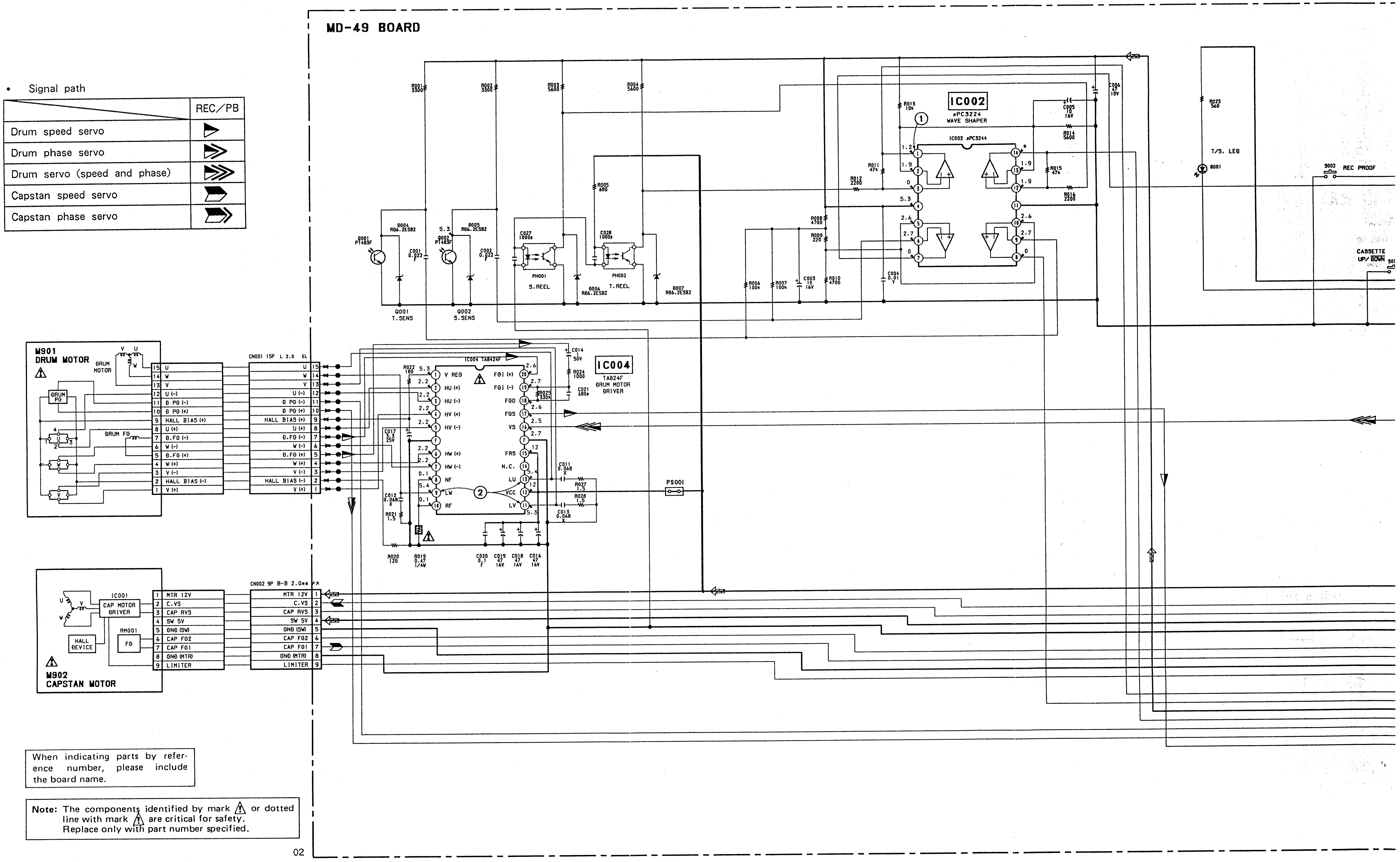
CN051	B-1
D051	A-7
D052	A-7
D054	C-5
D055	B-5
D058	B-7
D059	B-1
D060	B-1
IC051	C-7

MD-49 (MECHANISM DRIVE), DRUM MOTOR (M901), CAPSTAN MOTOR (M903), DS-51 (DEW SENSOR) SCHEMATIC DIAGRAMS

—Ref. No. MD-49 BOARD : 4,000 and DS-51 BOARD : 3,000 Series—

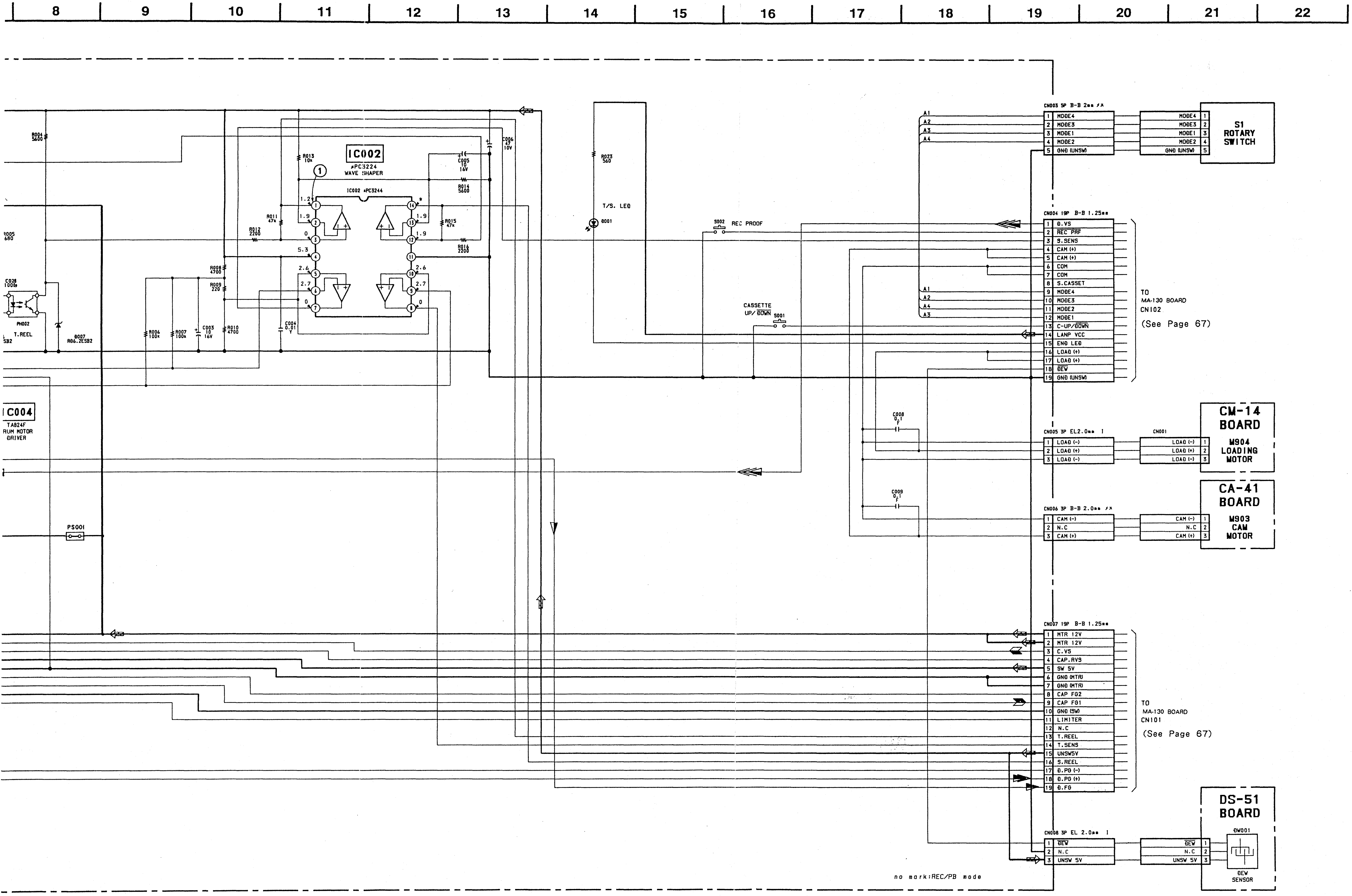
- Signal path

	REC/PB
Drum speed servo	▷
Drum phase servo	⊳⊳
Drum servo (speed and phase)	⊳⊳⊳
Capstan speed servo	➨
Capstan phase servo	➨➨


MD-49 BOARD
R001 3300
R002 3300
R003 5600
R004 5600
R005 680
Q001 PT483F
Q002 PT483F
D004 R06.2ESB2
D005 R06.2ESB2
D006 R06.2ESB2
D007 R06.2ESB2
C001 0.022 F
C002 0.022 F
5.3
C027 1000p
C028 1000p
PH001
S.REEL
PH002
T.REEL
Q001 T.SENS
Q002 S.SENS
IC002
μPC3224
WAVE SHAPER
IC002 μPC3244
R013 10k
R011 47k
R012 2200
R014 5600
R015 47k
R016 2200
C005 10 16V
C006 47 10V
R008 4700
R009 220
R010 4700
R006 100k
R007 100k
C003 10 16V
C004 0.01 Y
1.2
1.9
0
5.3
2.6
2.7
*
R023 560
T/S. LED
D001
S002 REC PROOF
CASSETTE UP/DOWN
M901
DRUM MOTOR
DRUM MOTOR
V U W
DRUM PG
DRUM FG
15 U
14 W
13 V
12 U (−)
11 D PG (−)
10 D PG (+)
9 HALL BIAS (+)
8 U (+)
7 D.FG (−)
6 W (−)
5 D.FG (+)
4 W (+)
3 V (−)
2 HALL BIAS (−)
1 V (+)
CN001 15P L 2.0 EL
IC004 TA8424F
IC004
TA824F
DRUM MOTOR
DRIVER
V REG
HU (+)
HU (−)
HV (+)
HV (−)
HW (+)
HW (−)
NF
LW
RF
FGI (+)
FGI (−)
FGO
FGS
VS
FRS
N.C.
LU
VCC
LV
R022 180
R024 1000
R025 330k
C014 1 50V
C021 680p
C017 3.3 25V
C012 0.068 X
R021 1.5
C011 0.068 X
C013 0.068 X
R027 1.5
R028 1.5
R020 120
R019 0.47 1/4W
C020 0.1 F
C019 47 16V
C018 47 16V
C016 47 16V
PS001
M902
CAPSTAN MOTOR
IC001
CAP MOTOR DRIVER
HALL DEVICE
RM001
FG
1 MTR 12V
2 C.VS
3 CAP RVS
4 SW 5V
5 GND (SW)
6 CAP FG2
7 CAP FG1
8 GND (MTR)
9 LIMITER
CN002 9P B-B 2.0mm メス
02

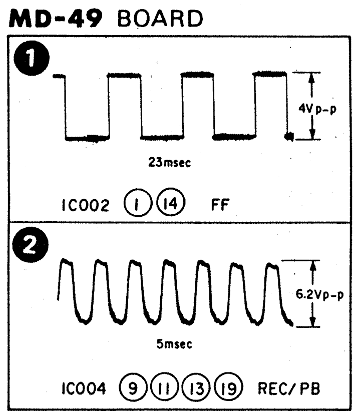
When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

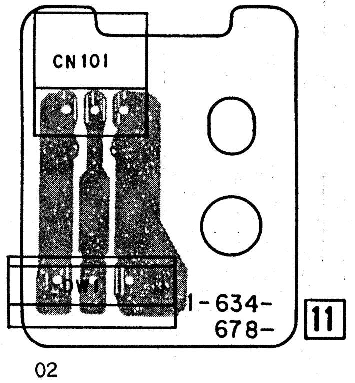

8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
R004
5600
R005
680
C028
1000p
PH002
T.REEL
SB2
D007
RD6.2ESB2
R006
100k
R007
100k
C003
10
16V
R008
4700
R009
220
R010
4700
R011
47k
R012
2200
R013
10k
IC002
μPC3224
WAVE SHAPER
IC002 μPC3244
1.2
1.9
0
5.3
2.6
2.7
0
*
1.9
1.9
2.6
2.7
0
C004
0.01
Y
C005
10
16V
R014
5600
R015
47k
R016
2200
C006
47
10V
IC004
TA824F
RUM MOTOR
DRIVER
PS001
R023
560
T/S. LED
D001
S002
REC PROOF
CASSETTE
UP/DOWN
S001
A1
A2
A3
A4
A1
A2
A4
A3
C008
0.1
F
C009
0.1
F
CN003 5P B-B 2mm メス
1 MODE4
2 MODE3
3 MODE1
4 MODE2
5 GND (UNSW)
MODE4 1
MODE3 2
MODE1 3
MODE2 4
GND (UNSW) 5
S1
ROTARY
SWITCH
CN004 19P B-B 1.25mm
1 D.VS
2 REC PRF
3 S.SENS
4 CAM (+)
5 CAM (+)
6 COM
7 COM
8 S.CASSET
9 MODE4
10 MODE3
11 MODE2
12 MODE1
13 C-UP/DOWN
14 LANP VCC
15 END LED
16 LOAD (+)
17 LOAD (+)
18 DEW
19 GND (UNSW)
TO
MA-130 BOARD
CN102
(See Page 67)
CN005 3P EL2.0mm I
CN001
1 LOAD (-)
2 LOAD (+)
3 LOAD (-)
LOAD (-) 1
LOAD (+) 2
LOAD (-) 3
CM-14
BOARD
M904
LOADING
MOTOR
CN006 3P B-B 2.0mm メス
1 CAM (-)
2 N.C
3 CAM (+)
CAM (-) 1
N.C 2
CAM (+) 3
CA-41
BOARD
M903
CAM
MOTOR
CN007 19P B-B 1.25mm
1 MTR 12V
2 MTR 12V
3 C.VS
4 CAP.RVS
5 SW 5V
6 GND (MTR)
7 GND (MTR)
8 CAP FG2
9 CAP FG1
10 GND (SW)
11 LIMITER
12 N.C
13 T.REEL
14 T.SENS
15 UNSW5V
16 S.REEL
17 D.PG (-)
18 D.PG (+)
19 D.FG
TO
MA-130 BOARD
CN101
(See Page 67)
DS-51
BOARD
DW001
DEW
SENSOR
CN008 3P EL 2.0mm I
1 DEW
2 N.C
3 UNSW 5V
DEW 1
N.C 2
UNSW 5V 3
no mark:REC/PB mode

MD-49 (MECHANISM DRIVE), DS-51 (DEW SENSOR) PRINTED WIRING BOARDS

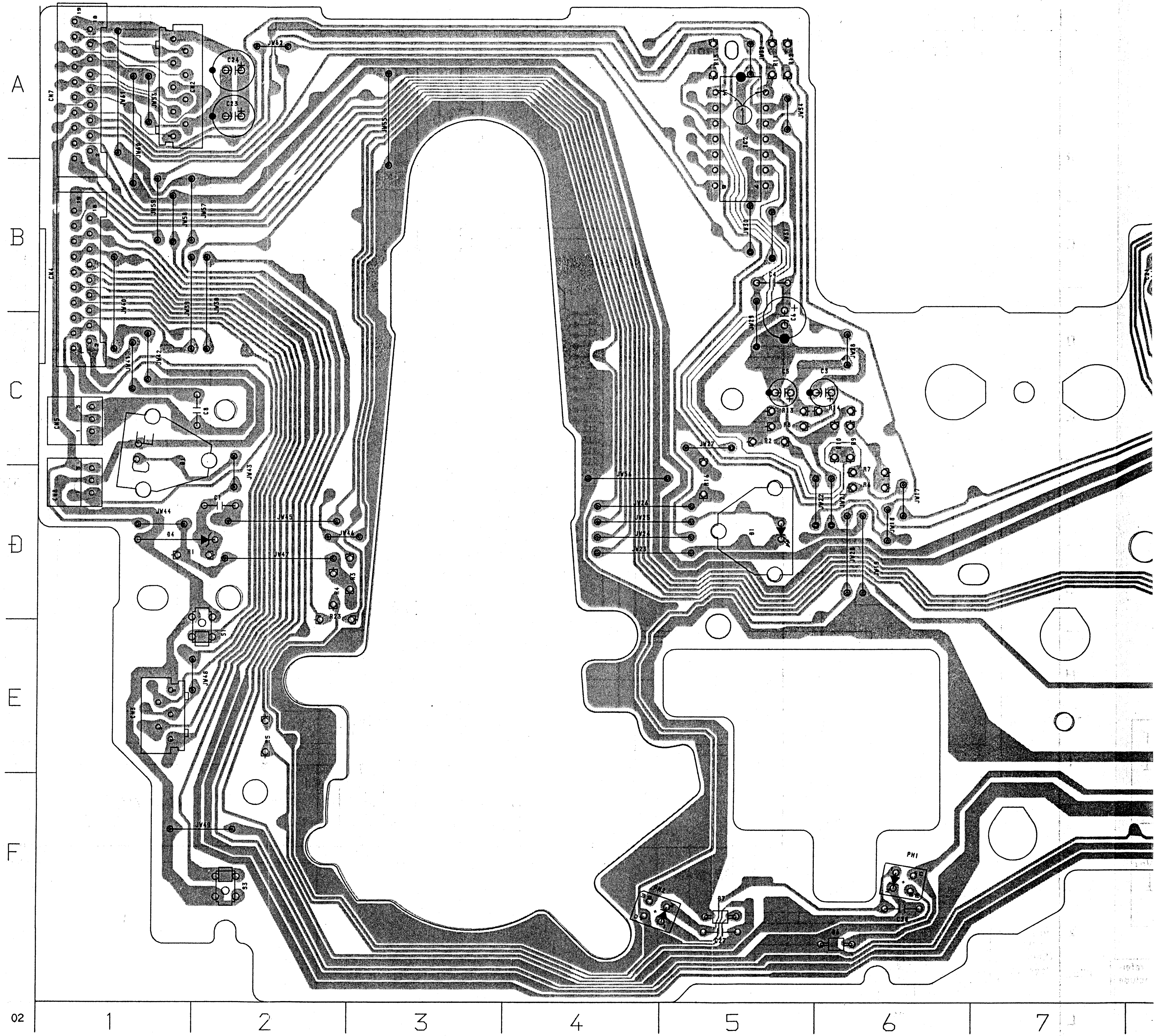
—Ref. No. MD-49 BOARD : 4,000 and DS-51 BOARD : 3,000 Series—

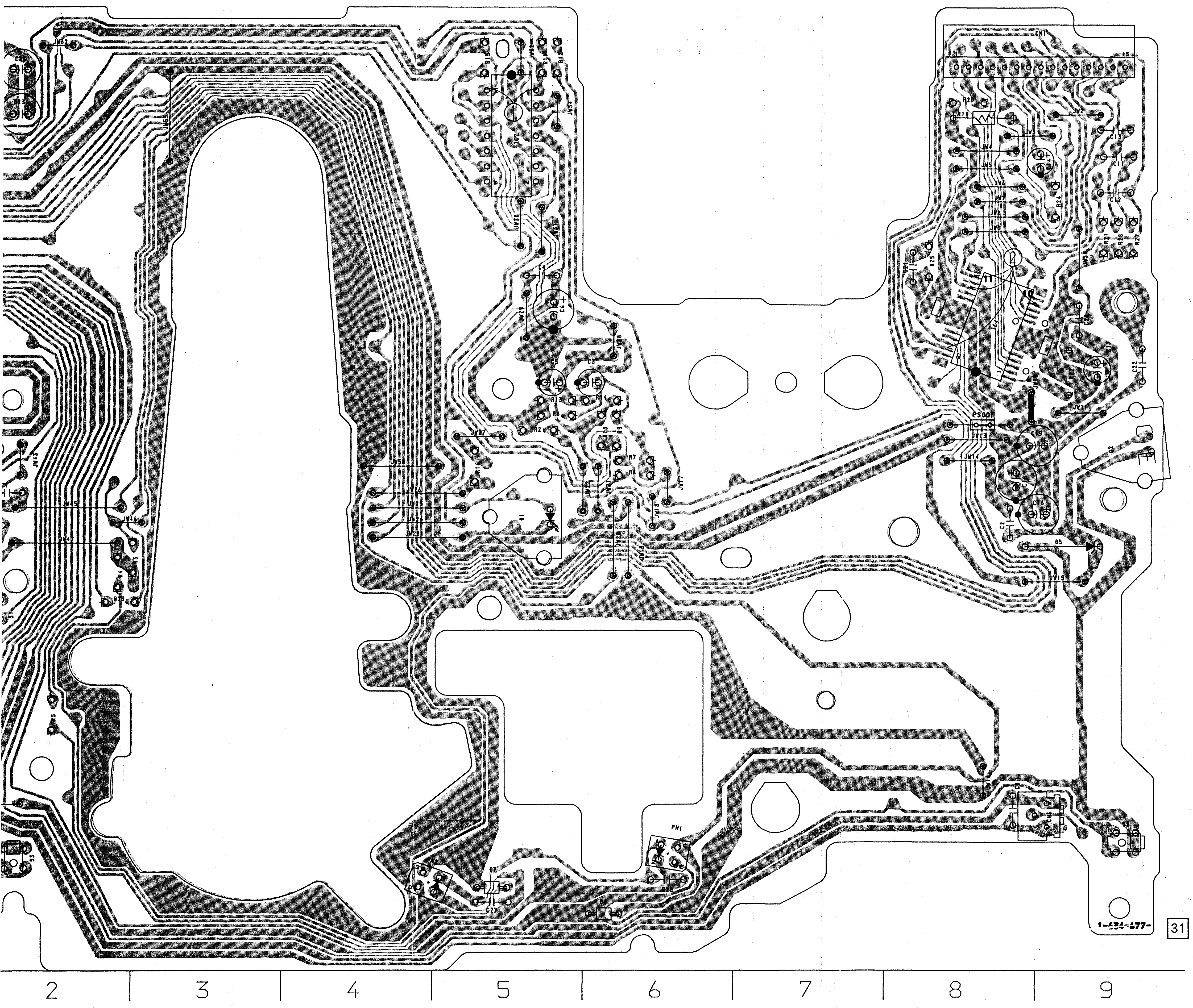


DS-51 BOARD


CN101
1-634-
678-
11
02

MD-49 BOARD

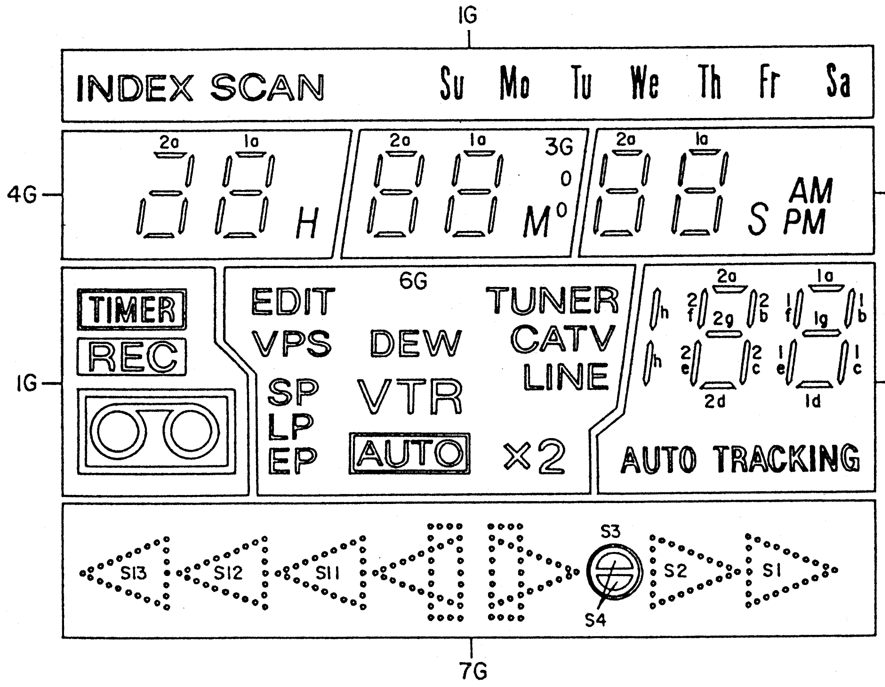

A
B
C
D
E
F
1
2
3
4
5
6
7
02
CN7
CN4
CN5
CN6
C24
C23
C8
C4
C5
C3
JV62
JV55
JV56
JV26
JV25
JV24
JV23
JV44
JV45
JV46
JV47
JV48
JV49
JV37
JV17
JV18
D4
R1
R2
R7
R8
R13
R14
R23
S1
S3
PH1

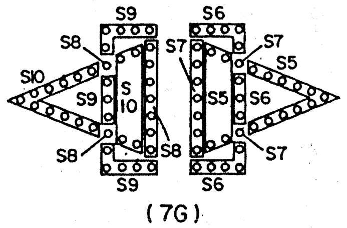

CN1
IC2
PS001
PH1
Q1
Q2
JV13
JV14
JV15
C3
C4
C5
C19
R13
R14
1-634-677-
31
2
3
4
5
6
7
8
9

MD-49 BOARD

CN001	A-9
CN002	A-1
CN003	E-1
CN004	B-1
CN005	C-1
CN006	F-8
D001	D-5
D004	D-1
D005	D-9
D006	F-6
D007	F-5
IC002	A-5
IC004	C-8
Q001	C-1
Q002	C-9

ND001

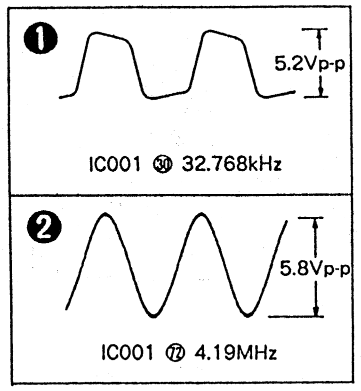

IG
INDEX SCAN
Su Mo Tu We Th Fr Sa
4G
2a
la
3G
H
M
S
AM
PM
2G
IG
TIMER
REC
EDIT
VPS
DEW
SP
LP
EP
VTR
AUTO
6G
TUNER
CATV
LINE
×2
AUTO TRACKING
5G
S13
S12
S11
S3
S4
S2
S1
7G


S9
S6
S8
S7
S5
S10
S9
S10
S5
S6
S8
S8
S7
S9
S6

(7G)

	7G	6G	5G	4G	3G	2G	1G
S1	S1	EP	2d	2d	2d	2d	–
S2	S2	LP	2e	2e	2e	2e	–
S3	○ (S3)	SP	2c	2c	2c	2c	OO
S4	⊖ (S4)	VTR	2g	2g	2g	2g	–
S5	S5	VPS	2f	–	2f	2f	REC
S6	S6	DEW	2b	2b	2b	2b	TIMER
S7	S7	EDIT	2a	2a	2a	2a	INDEX
S8	–	AUTO	AUTO TRAKING	H	M	S	SCAN
S9	–	×2	1d	1d	1d	1d	Su
S10	–	LINE	1e	1e	1e	1e	Mo
S11	S8	CATV	1c	1c	1c	1c	Tu
S12	S9	TUNER	1g	1g	1g	1g	We
S13	S10	–	1f	1f	1f	1f	Th
S14	S11	–	1b	1b	1b	1b	Fr
S15	S12	–	1a	1a	1a	1a	Sa
S16	S13	–	h	–	0 (UP)	AM	–
S17	–	–	–	–	0 (DOWN)	PM	–

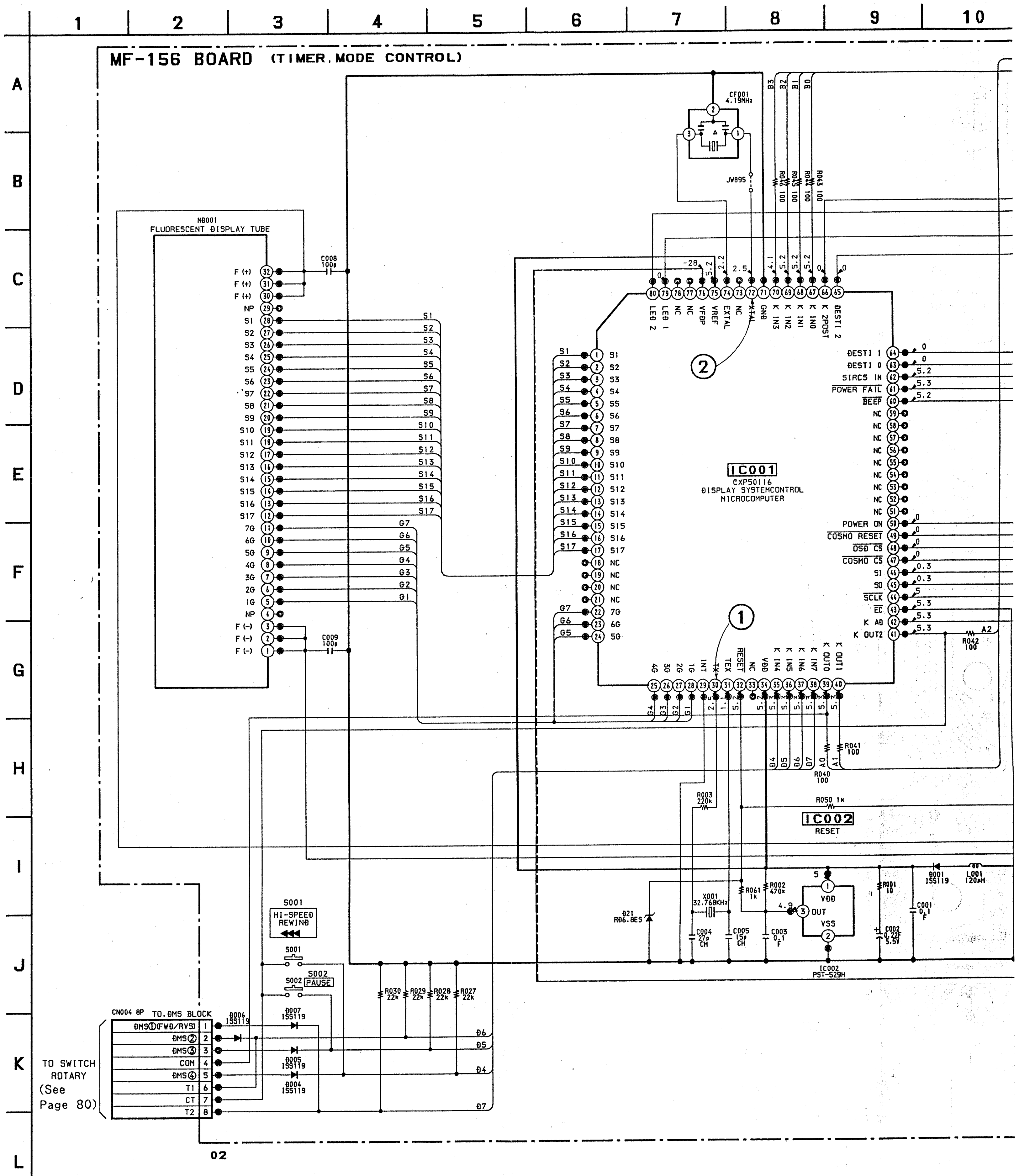
MF-156 Board



When indicating parts by reference number, please include the board name.

MF-156 (TIMER, MODE CONTROL) SCHEMATIC DIAGRAM

—Ref. No. MF-156 BOARD : 5,000 Series—


1
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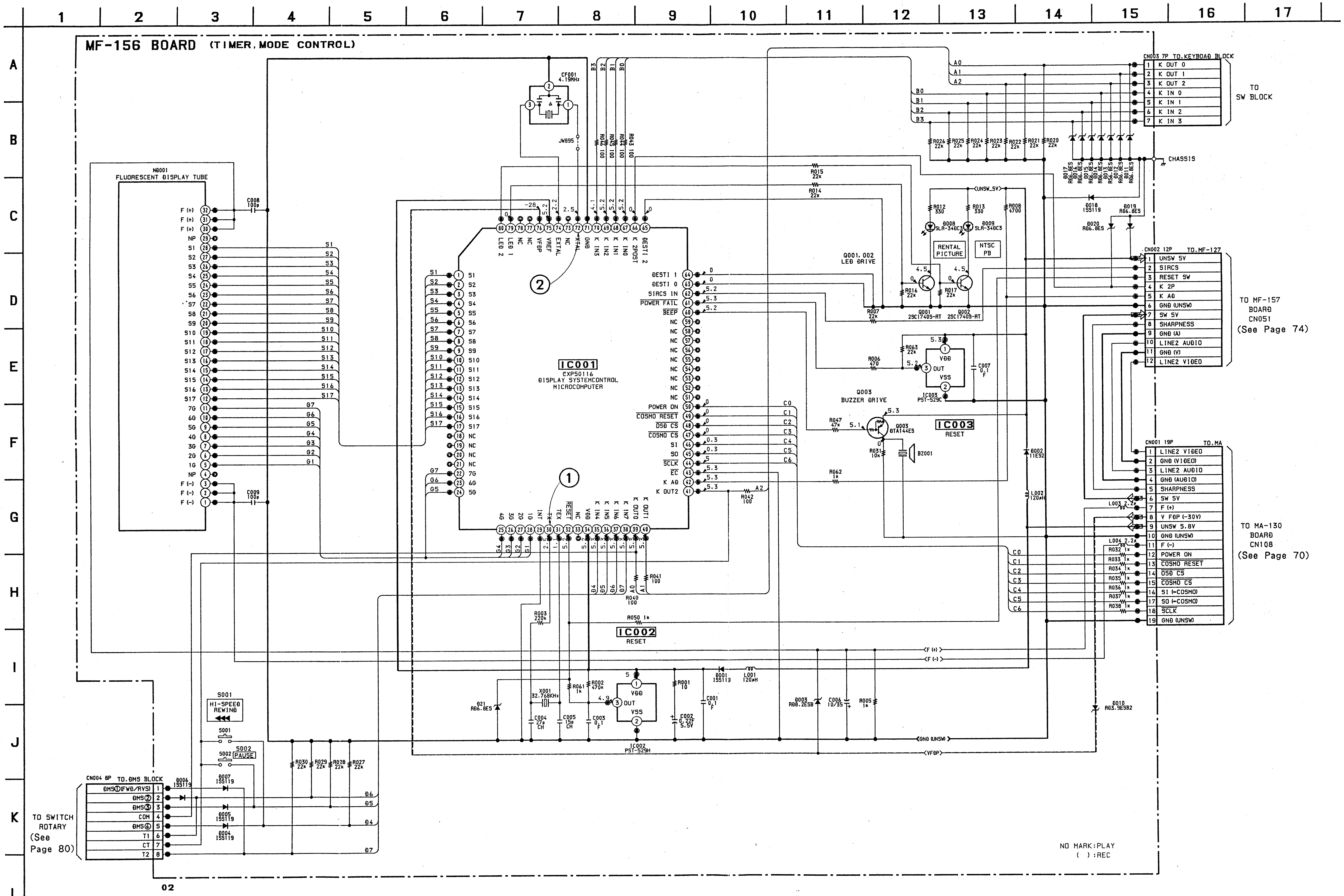
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
MF-156 BOARD (TIMER, MODE CONTROL)
ND001
FLUORESCENT DISPLAY TUBE
C008 100p
C009 100p
IC001
CXP50116
DISPLAY SYSTEMCONTROL MICROCOMPUTER
CF001 4.19MHz
JW895
R044 100
R045 100
R046 100
R043 100
DESTI 1
DESTI 0
SIRCS IN
POWER FAIL
BEEP
POWER ON
COSMO RESET
OSD CS
COSMO CS
SI
SO
SCLK
EC
K A0
K OUT2
R042 100
R041 100
R040 100
R003 220k
R050 1k
IC002
RESET
X001 32.768KHz
R061 1k
R002 470k
D21 RD6.8ES
C004 27p CH
C005 15p CH
C003 0.1 F
R001 10
C001 0.1 F
C002 0.22F 5.5V
D001 1SS119
L001 120μH
IC002 PST-529H
VDD
OUT
VSS
S001 HI-SPEED REWIND
S001
S002 PAUSE
S002
D006 1SS119
D007 1SS119
D005 1SS119
D004 1SS119
R030 22k
R029 22k
R028 22k
R027 22k
CN004 8P TO DMS BLOCK
DMS①(FWD/RVS)
DMS②
DMS③
COM
DMS④
T1
CT
T2
TO SWITCH ROTARY (See Page 80)
02
①
②

TIMER, MODE CONTROL TIMER, M

MF-156 (TIMER, MODE CONTROL) SCHEMATIC DIAGRAM

—Ref. No. MF-156 BOARD : 5,000 Series—

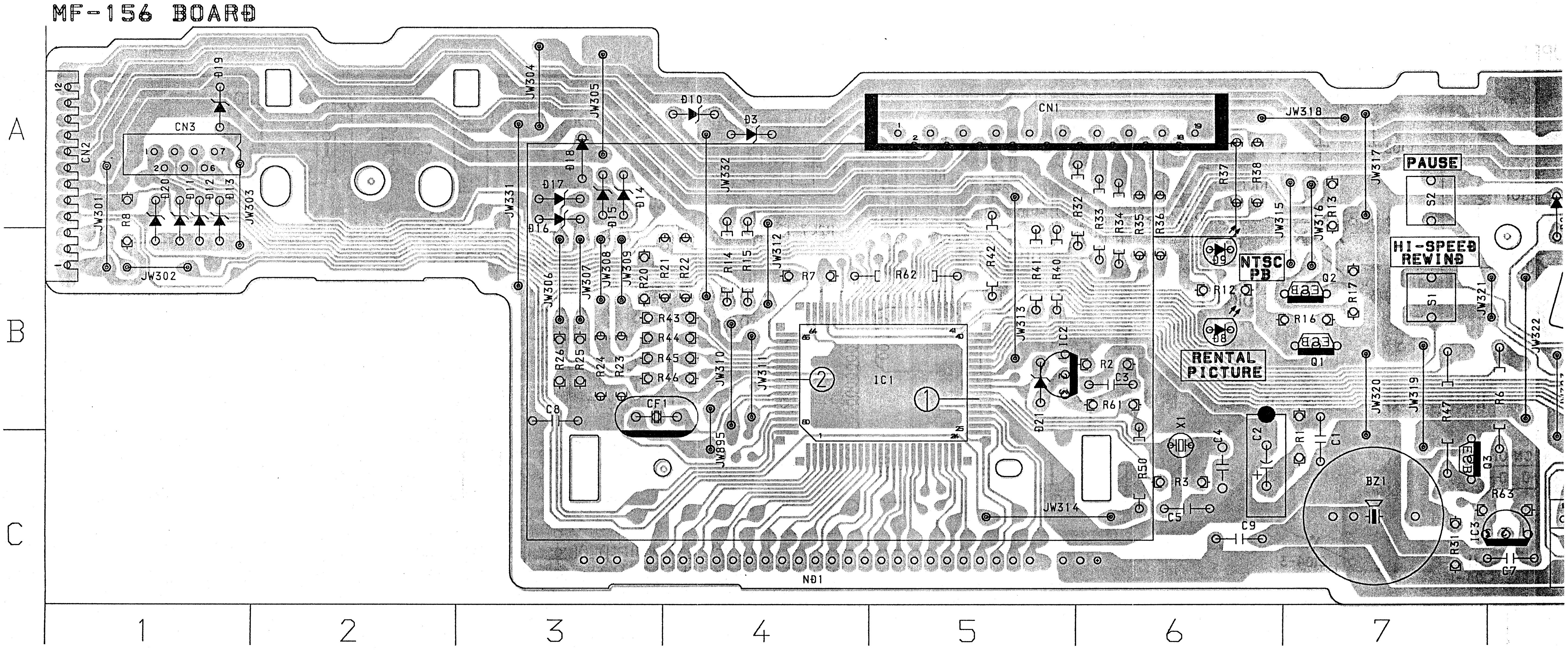


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
A
B
C
D
E
F
G
H
I
J
K
L
MF-156 BOARD (TIMER, MODE CONTROL)
ND001
FLUORESCENT DISPLAY TUBE
C008 100p
C009 100p
CF001 4.19MHz
JW895
IC001
CXP50116
DISPLAY SYSTEMCONTROL MICROCOMPUTER
DESTI 1
DESTI 0
SIRCS IN
POWER FAIL
BEEP
POWER ON
COSMO RESET
OSD CS
COSMO CS
SI
SO
SCLK
EC
K AD
K OUT2
LED 2
LED 1
VFDP
VREF
EXTAL
XTAL
GND
K IN3
K IN2
K IN1
K IN0
K 2POST
DESTI 2
INT
TEX
RESET
VDD
K IN4
K IN5
K IN6
K IN7
K OUT0
K OUT1
CN003 7P TO.KEYBOAD BLOCK
K OUT 0
K OUT 1
K OUT 2
K IN 0
K IN 1
K IN 2
K IN 3
TO SW BLOCK
CHASSIS
R015 22k
R014 22k
R012 330
R013 330
R008 4700
D008 SLR-340C3
D009 SLR-340C3
RENTAL PICTURE
NTSC PB
Q001, 002 LED DRIVE
Q001 2SC1740S-RT
Q002 2SC1740S-RT
R016 22k
R017 22k
R007 22k
CN002 12P TO.MF-127
UNSW 5V
SIRCS
RESET SW
K 2P
K AD
GND (UNSW)
SW 5V
SHARPNESS
GND (A)
LINE2 AUDIO
GND (V)
LINE2 VIDEO
TO MF-157 BOARD CN051 (See Page 74)
R063 22k
R006 470
IC003 PST-529C
C007 0.1
Q003 BUZZER DRIVE
Q003 DTA144ES
R047 47k
R031 10k
BZ001
IC003 RESET
R062 1k
R042 100
D002 11ES2
L002 120µH
L003 2.2µ
L004 2.2µ
CN001 19P TO.MA
LINE2 VIDEO
GND (VIDEO)
LINE2 AUDIO
GND (AUDIO)
SHARPNESS
SW 5V
F (+)
V FDP (-30V)
UNSW 5.8V
GND (UNSW)
F (-)
POWER ON
COSMO RESET
OSD CS
COSMO CS
SI (←COSMO)
SO (←COSMO)
SCLK
GND (UNSW)
TO MA-130 BOARD CN108 (See Page 70)
R032 1k
R033 1k
R034 1k
R035 1k
R036 1k
R037 1k
R038 1k
R041 100
R040 100
R003 220k
R050 1k
IC002 RESET
D21 RD6.8ES
X001 32.768KHz
R061 1k
R002 470k
C004 27p CH
C005 15p CH
C003 0.1 F
IC002 PST-529H
R001 10
C001 0.1 F
C002 0.22F 5.5V
D001 1SS119
L001 120µH
D003 RD8.2ESB
C006 10/35
R005 1k
D010 RD3.9ESB2
(GND (UNSW))
(VFDP)
(F (+))
(F (-))
(UNSW 5V)
S001 HI-SPEED REWIND
S001
S002 PAUSE
R030 22k
R029 22k
R028 22k
R027 22k
CN004 8P TO.DMS BLOCK
DMS① (FWD/RVS)
DMS②
DMS③
COM
DMS④
T1
CT
T2
D006 1SS119
D007 1SS119
D005 1SS119
D004 1SS119
TO SWITCH ROTARY (See Page 80)
NO MARK: PLAY
( ) : REC
02

TIMER, MODE CONTROL TIMER, MODE CONTROL

MF-156 (TIMER, MODE CONTROL) PRINTED WIRING BOARD

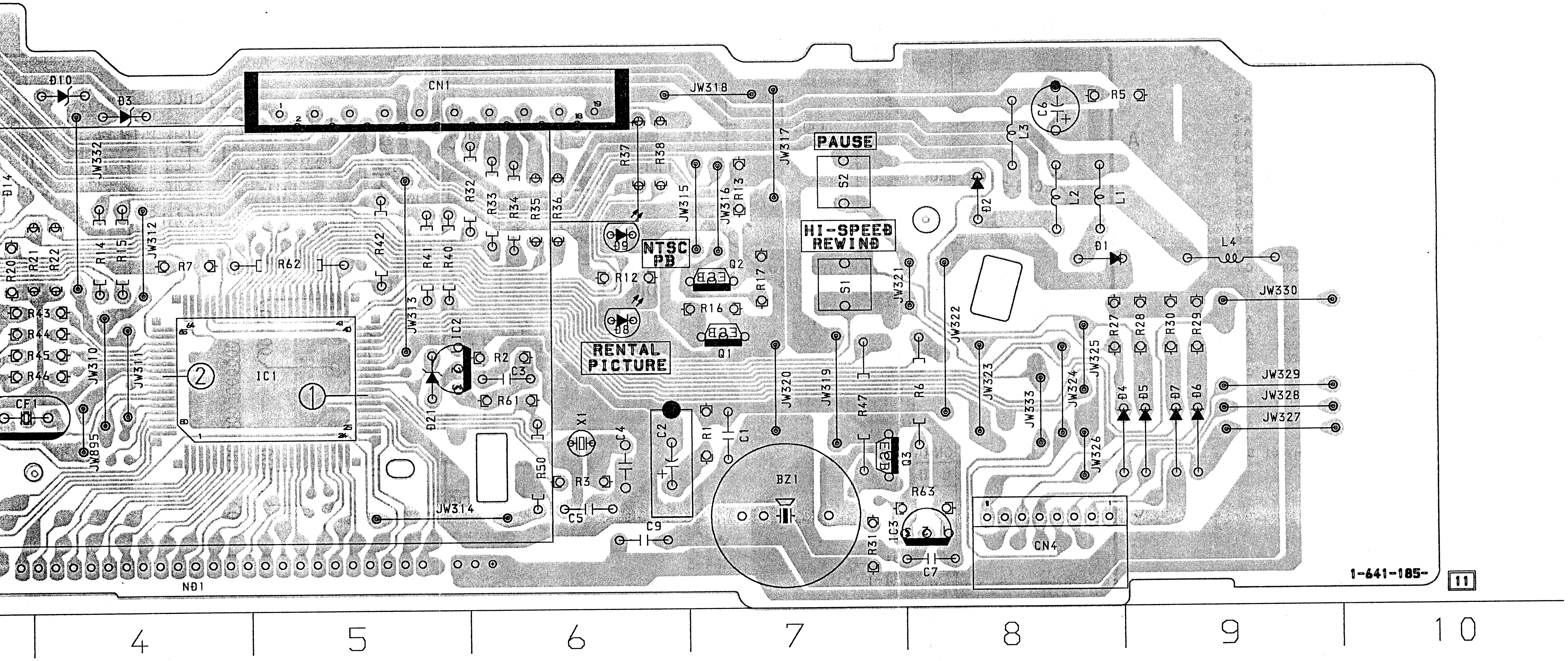
—Ref. No. MF-156 BOARD : 5,000 Series—


MF-156 BOARD
A
B
C
1
2
3
4
5
6
7
CN1
CN2
CN3
IC1
IC2
IC3
CF1
X1
BZ1
ND1
Q1
Q2
Q3
S1
S2
D3
D10
D14
D15
D16
D17
D18
D19
D20
D21
PAUSE
HI-SPEED REWIND
NTSC PB
RENTAL PICTURE
JW301
JW302
JW303
JW304
JW305
JW306
JW307
JW308
JW309
JW310
JW311
JW312
JW313
JW314
JW315
JW316
JW317
JW318
JW319
JW320
JW321
JW322
JW331
JW332
JW895

02

MF-156 BOARD

CN001	A-5
CN002	A-1
CN003	A-1
CN004	C-8
D001	B-8
D002	A-8
D003	A-4
D004	B-8
D005	B-9
D006	B-9
D007	B-9
D008	B-6
D009	B-6
D010	A-4
D011	A-1
D012	A-1
D013	A-1
D014	A-3
D015	A-3
D016	A-3
D017	A-3
D018	A-3
D019	A-1
D020	A-1
D021	B-5
IC001	B-5
IC002	B-5
IC003	C-8
Q001	B-7
Q002	B-7
Q003	C-7


CN1
JW318
JW317
PAUSE
S2
HI-SPEED
REWIND
S1
NTSC
PB
RENTAL
PICTURE
D10
D3
D14
JW332
JW312
JW313
JW310
JW311
JW895
JW314
JW315
JW316
JW319
JW320
JW321
JW322
JW323
JW324
JW325
JW326
JW333
JW327
JW328
JW329
JW330
R7
R62
R42
R4
R40
R32
R33
R34
R35
R36
R37
R38
R12
R13
R16
R17
R20
R21
R22
R14
R15
R43
R44
R45
R46
R2
R61
R50
R3
R1
R47
R6
R63
R31
R5
R27
R28
R30
R29
C1
C2
C3
C4
C5
C6
C7
C9
D1
D2
D4
D5
D6
D7
D8
D9
D21
Q1
Q2
Q3
L1
L2
L3
L4
IC1
IC2
IC3
X1
CF1
BZ1
CN4
ND1
①
②
1-641-185-
11
4
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10

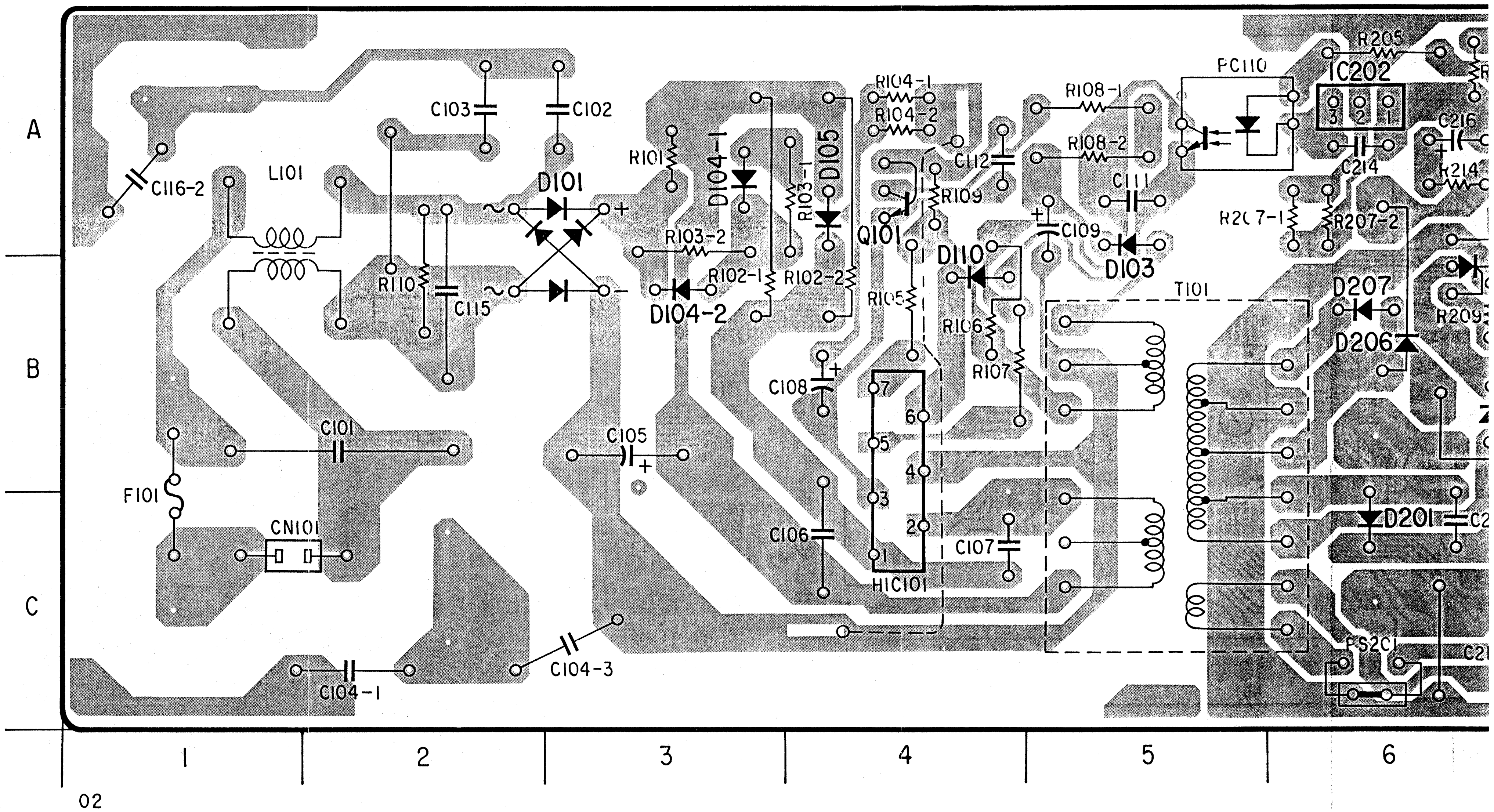
POWER BLOCK (POWER SUPPLY) PRINTED WIRING BOARD

—Ref. No. POWER BLOCK BOARD : 5,000 Series—

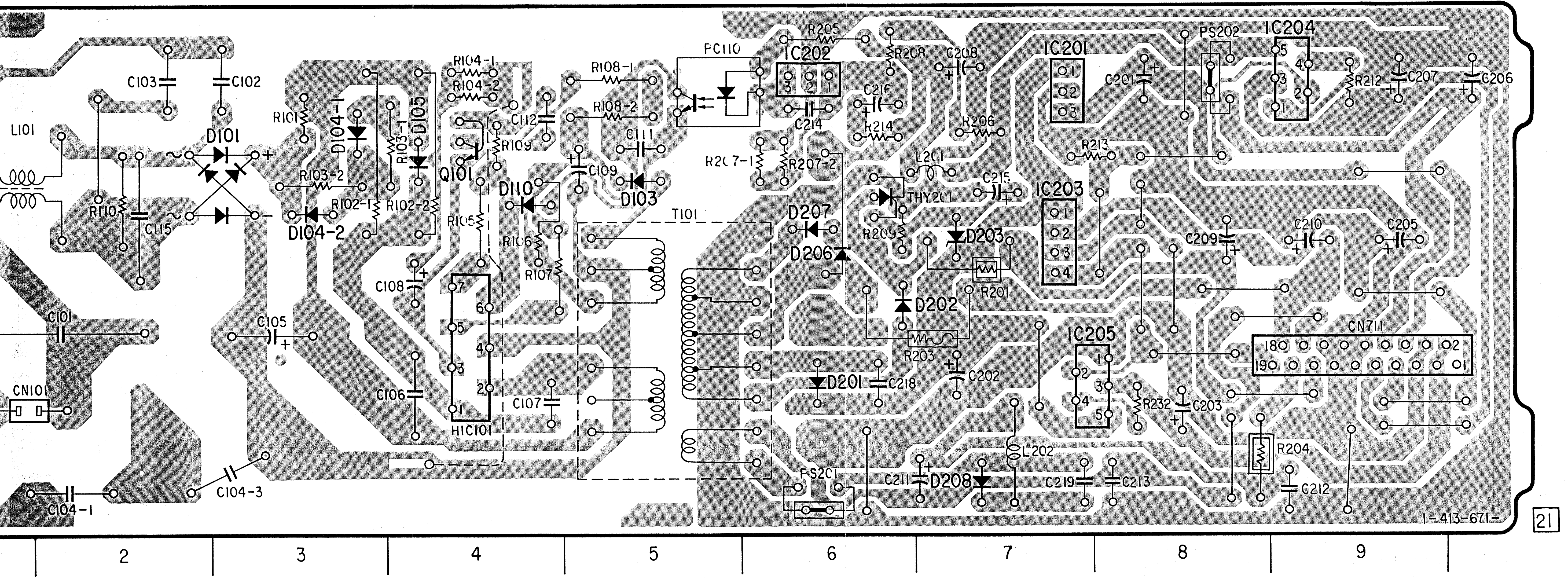
POWER SUPPLY BOARD

CN711	B-9
D101	A-3
D103	A-5
D104-1	A-3
D104-2	B-3
D105	A-4
D110	B-4
D201	C-6
D202	B-6
D203	B-7
D206	B-6
D207	B-6
D208	C-7
HIC101	C-4
IC201	A-7
IC202	A-6
IC203	B-7
IC204	A-9
IC205	C-8
PC110	A-5
Q101	A-4
THY201	B-6

【POWER SUPPLY BOARD】


A
B
C
1
2
3
4
5
6
02
C116-2
L101
C103
C102
R101
D104-1
D105
D101
R103-1
R104-1
R104-2
C112
R109
Q101
R108-1
R108-2
C111
PC110
R205
IC202
C216
C214
R214
R207-1
R207-2
C109
D103
D110
R103-2
R110
C115
R102-1
R102-2
D104-2
R105
R106
R107
T101
D207
D206
R209
C108
HIC101
C101
C105
F101
CN101
C106
C107
D201
PS201
C104-1
C104-3

PLY BOARD】


L101
C103
C102
D101
R101
D104-1
R103-1
D105
R104-1
R104-2
R108-1
R108-2
PC110
IC202
R205
R208
C208
IC201
PS202
IC204
C201
R212
C207
C206
C216
C214
R214
C112
C111
R109
Q101
R103-2
R110
C115
R102-1
R102-2
D104-2
D110
R105
C109
D103
R207-1
R207-2
R206
L201
R213
THY201
C215
IC203
D207
R209
D203
D206
T101
R106
R107
C108
C209
C210
C205
R201
D202
C101
C105
HIC101
C106
C107
R203
IC205
CN711
C202
D201
C218
R232
C203
CN101
L202
R204
C104-1
C104-3
PS201
C211
D208
C219
C213
C212
1-413-671-
21
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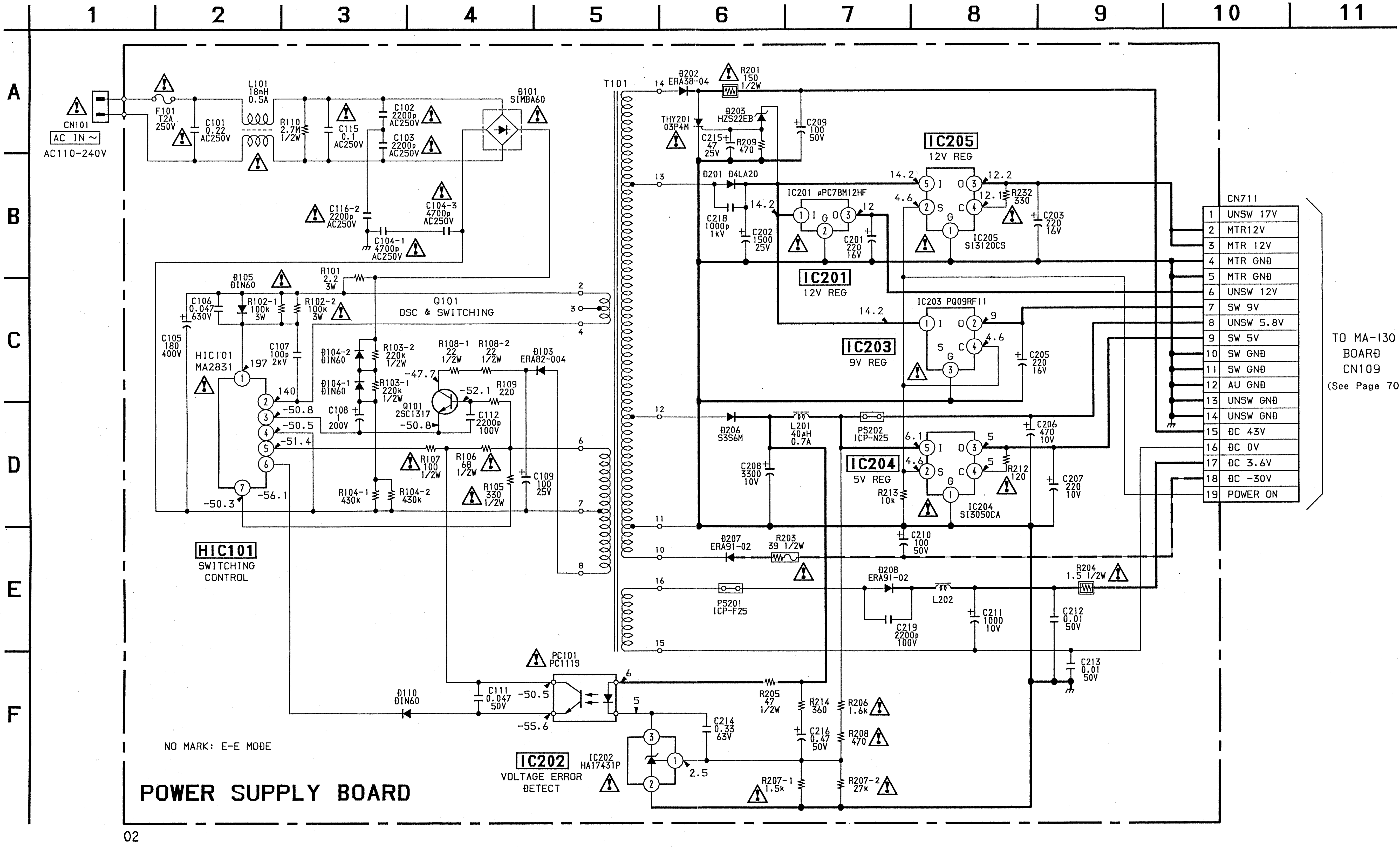
8
9

POWER BLOCK (POWER SUPPLY) SCHEMATIC DIAGRAM

—Ref. No. POWER BLOCK BOARD : 5,000 Series—



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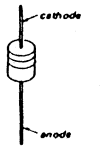
11
A
B
C
D
E
F
CN101
AC IN ~
AC110-240V
F101
T2A
250V
C101
0.22
AC250V
L101
18mH
0.5A
R110
2.7M
1/2W
C115
0.1
AC250V
C102
2200p
AC250V
C103
2200p
AC250V
Đ101
SIMBA60
C116-2
2200p
AC250V
C104-3
4700p
AC250V
C104-1
4700p
AC250V
R101
2.2
3W
Đ105
ĐIN60
C106
0.047
630V
R102-1
100k
3W
R102-2
100k
3W
Q101
OSC & SWITCHING
C105
180
400V
HIC101
MA2831
C107
100p
2kV
197
140
-50.8
-50.5
-51.4
-56.1
-50.3
Đ104-2
ĐIN60
Đ104-1
ĐIN60
R103-2
220k
1/2W
R103-1
220k
1/2W
R108-1
22
1/2W
R108-2
22
1/2W
Đ103
ERA82-004
-47.7
-52.1
R109
220
Q101
2SC1317
C108
1
200V
-50.8
C112
2200p
100V
R107
100
1/2W
R106
68
1/2W
C109
100
25V
R105
330
1/2W
R104-1
430k
R104-2
430k
HIC101
SWITCHING CONTROL
NO MARK: E-E MODE
POWER SUPPLY BOARD
02
T101
Đ202
ERA38-04
R201
150
1/2W
THY201
03P4M
Đ203
HZS22EB
C215
47
25V
R209
470
C209
100
50V
Đ201
Đ4LA20
C218
1000p
1kV
14.2
C202
1500
25V
IC201 µPC78M12HF
12
C201
220
16V
IC201
12V REG
IC205
12V REG
14.2
12.2
4.6
12.1
R232
330
C203
220
16V
IC205
SI3120CS
IC203 PQ09RF11
14.2
9
4.6
IC203
9V REG
C205
220
16V
Đ206
5356M
L201
40µH
0.7A
PS202
ICP-N25
C206
470
10V
6.1
5
4.6
5
C208
3300
10V
IC204
5V REG
R212
120
R213
10k
IC204
SI3050CA
C207
220
10V
Đ207
ERA91-02
R203
39 1/2W
C210
100
50V
Đ208
ERA91-02
L202
R204
1.5 1/2W
PS201
ICP-F25
C219
2200p
100V
C211
1000
10V
C212
0.01
50V
C213
0.01
50V
PC101
PC111S
C111
0.047
50V
-50.5
-55.6
Đ110
ĐIN60
R205
47
1/2W
R214
360
R206
1.6k
C214
0.33
63V
C216
0.47
50V
R208
470
IC202
VOLTAGE ERROR DETECT
IC202
HA17431P
2.5
R207-1
1.5k
R207-2
27k
CN711
1 UNSW 17V
2 MTR12V
3 MTR 12V
4 MTR GNĐ
5 MTR GNĐ
6 UNSW 12V
7 SW 9V
8 UNSW 5.8V
9 SW 5V
10 SW GNĐ
11 SW GNĐ
12 AU GNĐ
13 UNSW GNĐ
14 UNSW GNĐ
15 ĐC 43V
16 ĐC 0V
17 ĐC 3.6V
18 ĐC -30V
19 POWER ON
TO MA-130 BOARĐ CN109
(See Page 70)

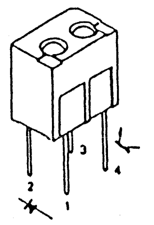
4-3. SEMICONDUCTORS

GL451VS1
RD3.9ES-B2
RD6.2ES-B2
RD6.8ES-B2
RD8.2ES-B2
1SR139-100
1SS119

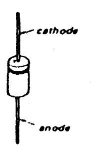


cathode
anode

PS6002



RD5.1EL2



cathode
anode

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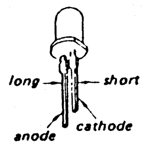
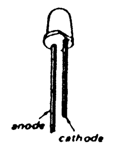


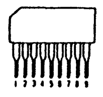
long
short
anode
cathode

SEL2510C-D

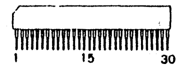


anode
cathode

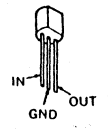
BA7021



LA7297



PST529C
PST529H



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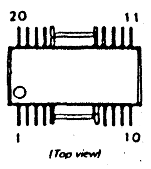

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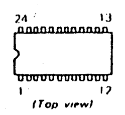
(Top view)

TA8823N



24
13
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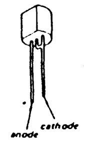
12
(Top view)

μPC574J



cathode
anode

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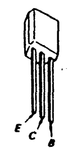
DTA144ES
2SC1815-Y



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PT483F1S
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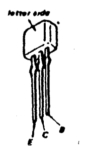
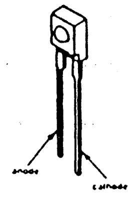
2SC2785-HFE



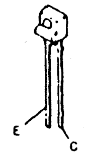
letter side
E
C
B

GL451V

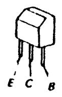


anode
cathode

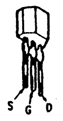
PT483F1S



2SD774-34



2SK381-B



SECTION 5

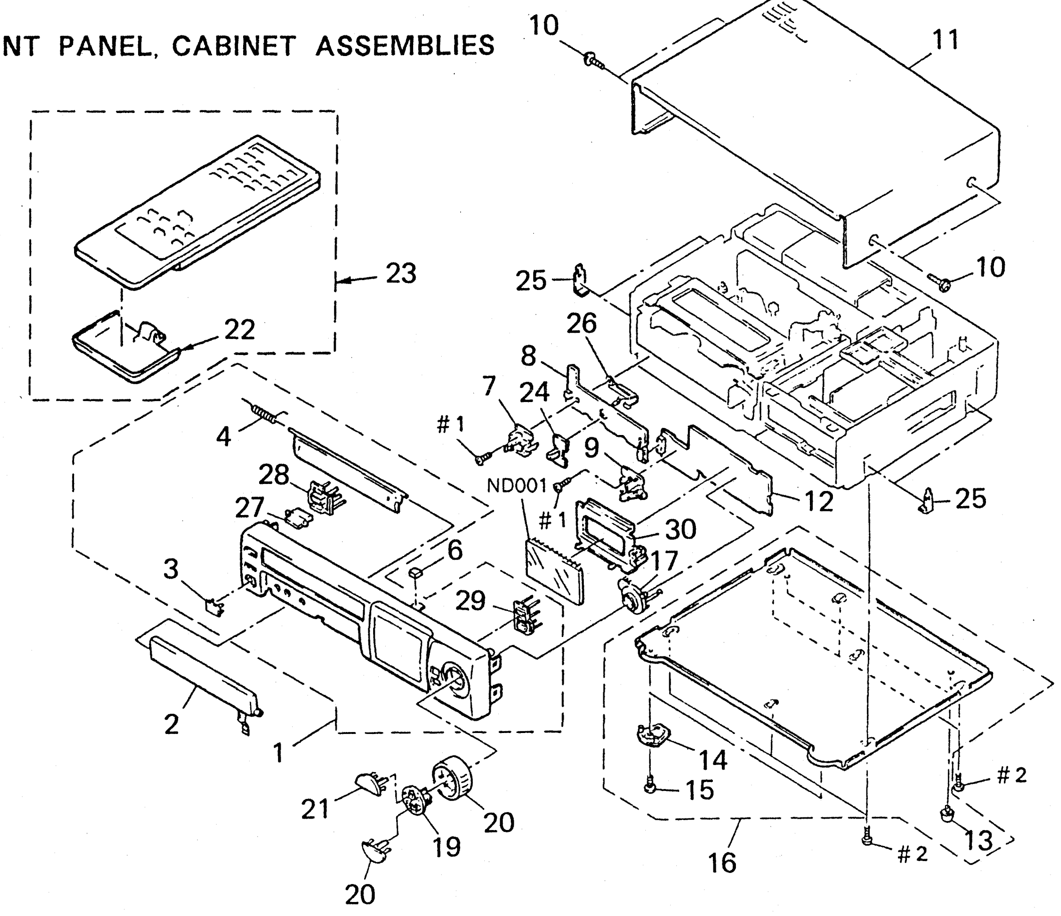
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1. FRONT PANEL, CABINET ASSEMBLIES



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24
#1
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27
ND001
#1
12
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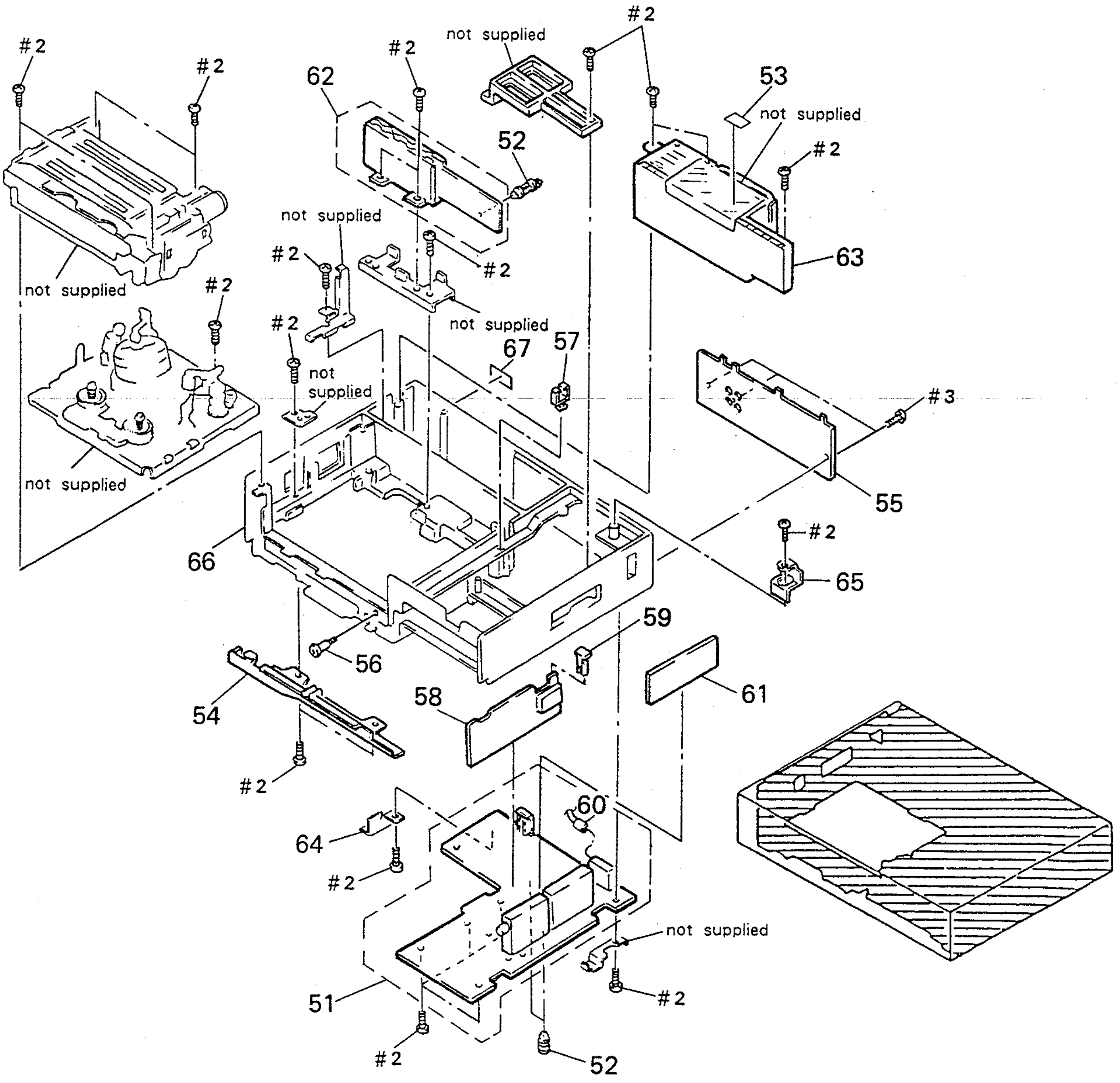
2
1
14
15
#2
21
20
19
20
16
#2
13

Ref. No.	Part No.	Description	Remark
1	X-3940-928-1	PANEL ASSY, FRONT (X55ME)	
1	X-3940-929-1	PANEL ASSY, FRONT (X55DH)	
1	X-3940-930-1	PANEL ASSY, FRONT (383)	
2	1-466-601-61	SWITCH BLOCK, CONTROL (X55ME)	
2	1-466-601-71	SWITCH BLOCK, CONTROL (X55DH)	
2	1-466-601-81	SWITCH BLOCK, CONTROL (383)	
3	3-741-981-21	WINDOW, LAY CATCHER BLOCK	
4	3-941-520-01	SPRING, FL	
5	3-945-096-01	DOOR, CASSETTE	
6	3-884-171-00	STOPPER	
7	3-741-966-01	PLATE (LEFT), FULCRUM, DOOR	
* 8	A-6756-295-A	MF-157 BOARD, COMPLETE (X55ME)	
* 8	A-6756-298-A	MF-157 BOARD, COMPLETE (X55DH)	
* 8	A-6756-300-A	MF-157 BOARD, COMPLETE (383)	
9	3-741-967-01	PLATE (RIGHT), FULCRUM, DOOR	
10	3-710-901-11	SCREW, TAPPING	
11	3-741-985-21	CASE, UPPER	
* 12	A-6721-435-A	MF-156 BOARD, COMPLETE	
13	3-670-155-11	LEG	
14	3-941-509-01	INSULATOR	
15	3-721-343-01	SCREW, FIXED, M4X7	
16	X-3940-317-1	PLATE ASSY, BOTTOM	
17	1-572-662-11	SWITCH, ROTARY	
18	3-941-512-01	RING, SHUTTLE	
19	3-941-515-01	HOLDER, BUTTON	
20	3-941-511-61	BUTTON, STOP	
21	3-941-510-61	BUTTON, PLAYBACK	
22	3-707-584-01	COVER, BATTERY	
23	1-465-864-21	REMOTE COMMANDER (RMT-V109A)	
24	3-744-217-01	KNOB, SELECTION	
* 25	3-741-992-01	STOPPER, UPPER CASE	
26	3-741-968-01	PLATE, GROUND, MF	
27	3-941-518-01	TIP, POWER BUTTON	
28	3-941-967-01	BUTTON, POWER EJECT	
29	3-941-970-31	BUTTON, PAUSE	
30	3-942-334-01	HOLDER, FL	
ND001	1-519-668-31	INDICATION TUBE, FLUORESCENT	

5-2. CHASSIS ASSEMBLY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not supplied
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61
58
54
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60
64
#2
not supplied
#2
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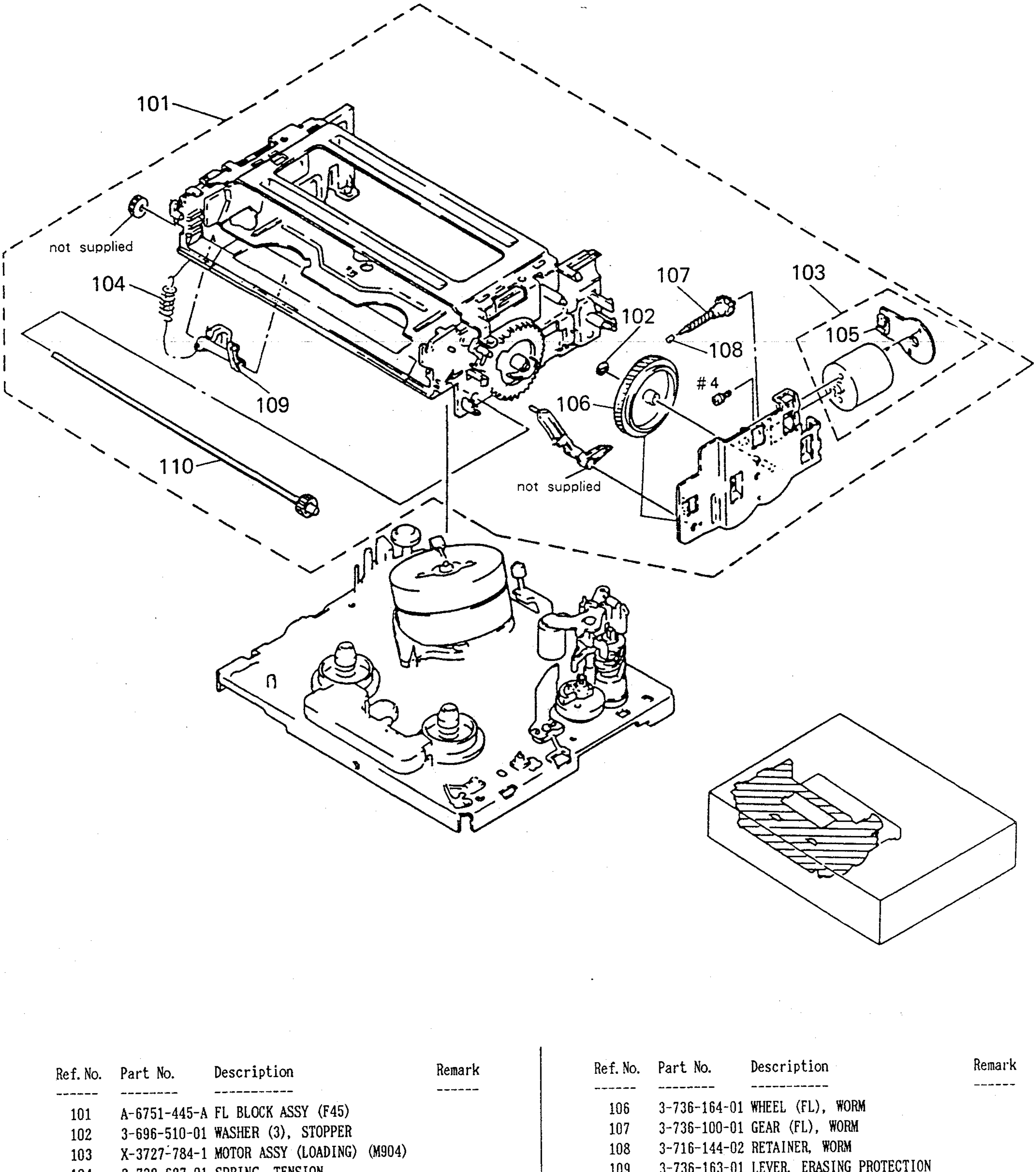
#2
52

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	A-6756-296-A	MA-130 BOARD, COMPLETE (X55ME)	
* 51	A-6756-299-A	MA-130 BOARD, COMPLETE (X55DH)	
* 51	A-6756-301-A	MA-130 BOARD, COMPLETE (383)	
52	3-682-057-11	SPACER (SMALL)	
53	9-911-839-XX	RETAINER (B), MICROPHONE	
54	3-941-971-11	ESCUTCHEON, FRAME	
55	3-941-514-21	PLATE, ORNAMENTAL, JACK (383/X55ME)	
55	3-941-514-41	PLATE, ORNAMENTEL, JACK (X55DH)	
56	3-741-948-01	SCREW (3), SPECIAL (+) TAPPING	
57	4-309-753-00	HOLDER, WIRE	
* 58	A-6756-297-A	AO-24 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
* 59	3-738-240-11	KNOB, PC BOARD	
60	1-555-110-00	CABLE, PIN	
* 61	A-6727-384-A	YC-110 BOARD, COMPLETE	
* 62	A-6727-382-A	RP-140 BOARD, COMPLETE	
⚠63	1-413-671-12	POWER BLOCK	
* 64	3-741-962-01	PLATE, GROUND, JMP	
* 65	3-741-963-01	BRACKET, RF	
* 66	3-741-990-01	FRAME, MOLD	
* 67	3-945-099-01	LABEL, MODEL NUMBER (NO. 2) (X55ME)	
* 67	3-945-105-01	LABEL, MODEL NUMBER (NO. 2) (X55DH)	
* 67	3-945-106-01	LABEL, MODEL NUMBER (NO. 2) (383)	

5-3. FL CASSETTE COMPARTMENT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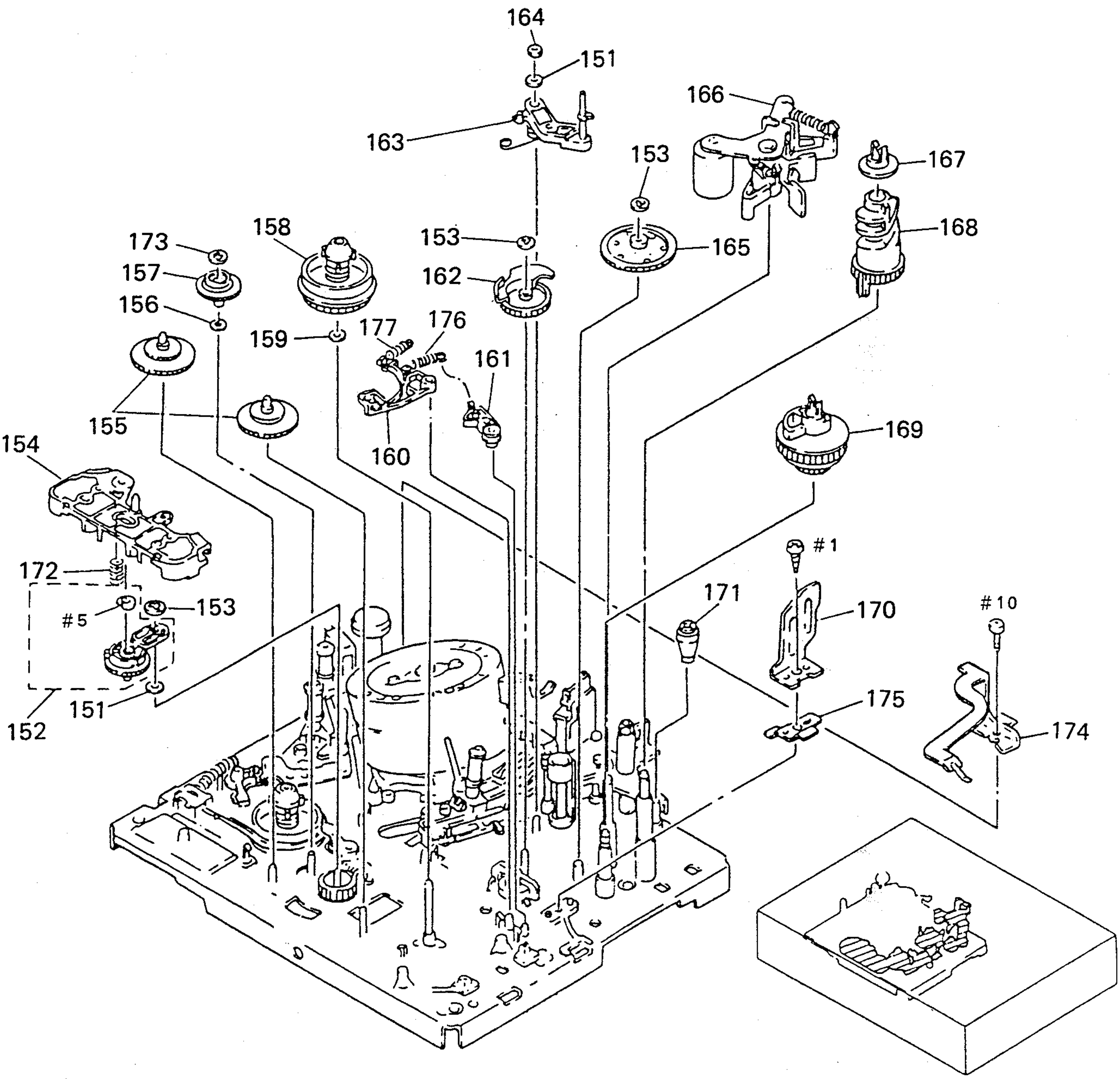
#4
106
not supplied

Ref. No.	Part No.	Description	Remark
101	A-6751-445-A	FL BLOCK ASSY (F45)	
102	3-696-510-01	WASHER (3), STOPPER	
103	X-3727-784-1	MOTOR ASSY (LOADING) (M904)	
104	3-739-687-01	SPRING, TENSION	
105	1-506-482-11	CONNECTOR 3P, MALE	
106	3-736-164-01	WHEEL (FL), WORM	
107	3-736-100-01	GEAR (FL), WORM	
108	3-716-144-02	RETAINER, WORM	
109	3-736-163-01	LEVER, ERASING PROTECTION	
110	X-3727-775-2	GEAR (RIGHT) ASSY, MIDWAY	

5-4. MECHANISM DECK 1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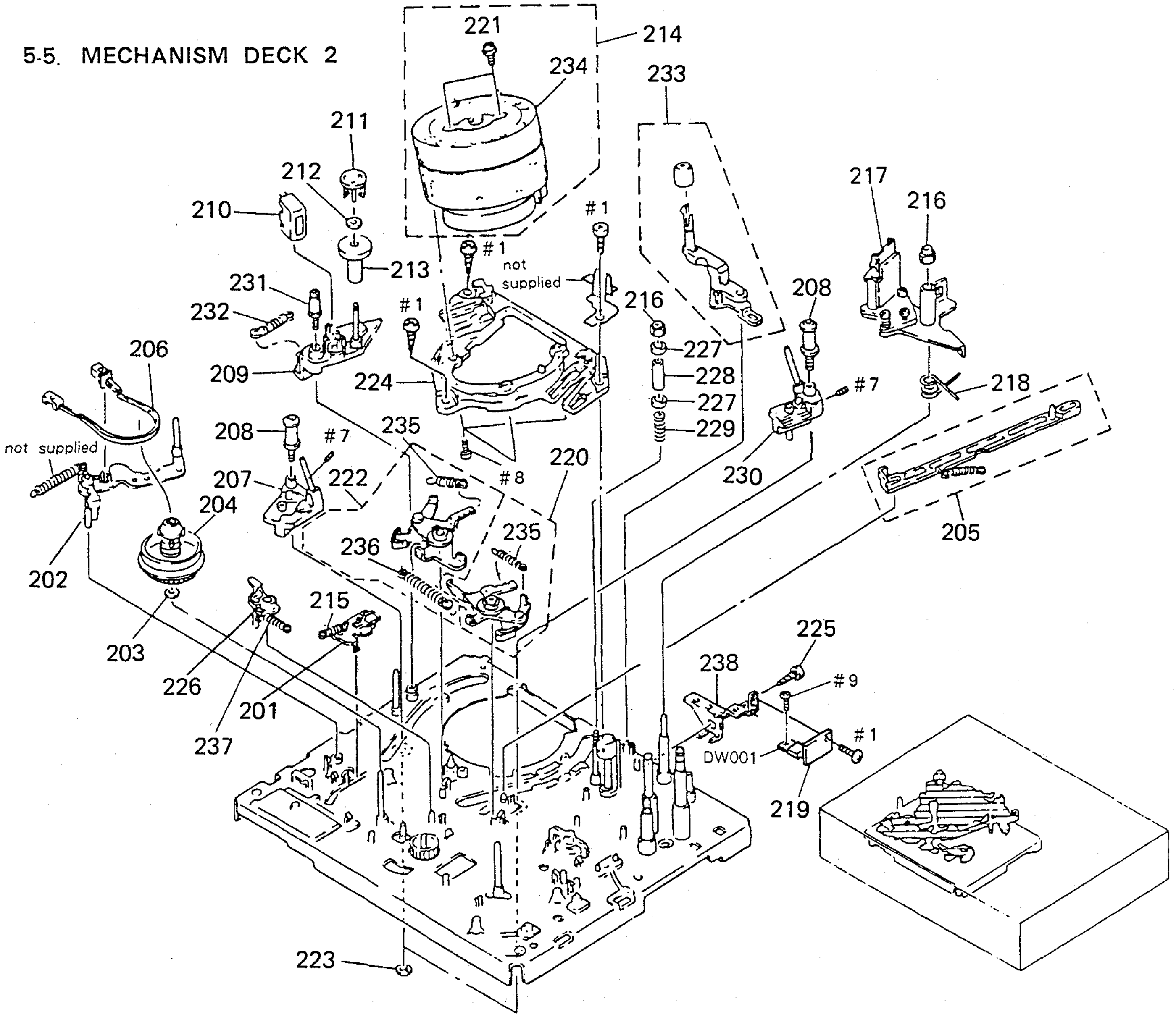
174
152

Ref. No.	Part No.	Description	Remark
151	3-701-438-11	WASHER, 2.5	
152	X-3727-776-1	ARM ASSY, PENDULUM	
153	3-669-595-00	WASHER (2), STOPPER	
154	3-736-172-02	RELEASE, LOCK, REEL	
155	X-3727-795-1	GEAR ASSY, RELAY	
156	3-736-074-01	RETAINER (SMALL), THRUST	
157	3-736-037-01	GEAR, REW	
158	X-3749-198-2	TABLE ASSY (S), REEL	
159	3-738-212-21	RETAINER, THRUST, REEL TABLE	
160	X-3733-335-1	BRAKE ASSY (AT), T SOFT	
161	3-736-105-01	ARM, REV BRAKE	
162	3-736-143-01	GEAR, RVS CAM	
163	X-3729-911-1	ARM ASSY, RVS	
164	3-736-740-01	NUT (M2X0.25), NYLON	
165	3-736-116-01	GEAR, COMMUNICATION	
166	X-3727-770-1	PINCH ROLLER BLOCK ASSY	
167	3-736-111-01	STOPPER	
168	3-736-136-01	CAM, ELEVATOR	
169	3-943-700-01	GEAR (LO), PRESS CAM	
170	3-736-109-01	PLATE, OPEN, LID	
171	3-738-250-01	SCREW, AC ADJUSTMENT	
172	3-736-020-11	SPRING, COMPRESSION	
173	3-736-069-01	RETAINER, SPRING	
174	X-3733-304-1	GROUND ASSY, SHAFT	
175	3-942-829-01	SPRING (2) (ATOM), GROUND, FL	
176	3-736-025-01	SPRING (REV BRAKE), TENSION	
177	3-736-024-01	SPRING, TENSION	

5-5. MECHANISM DECK 2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DW001
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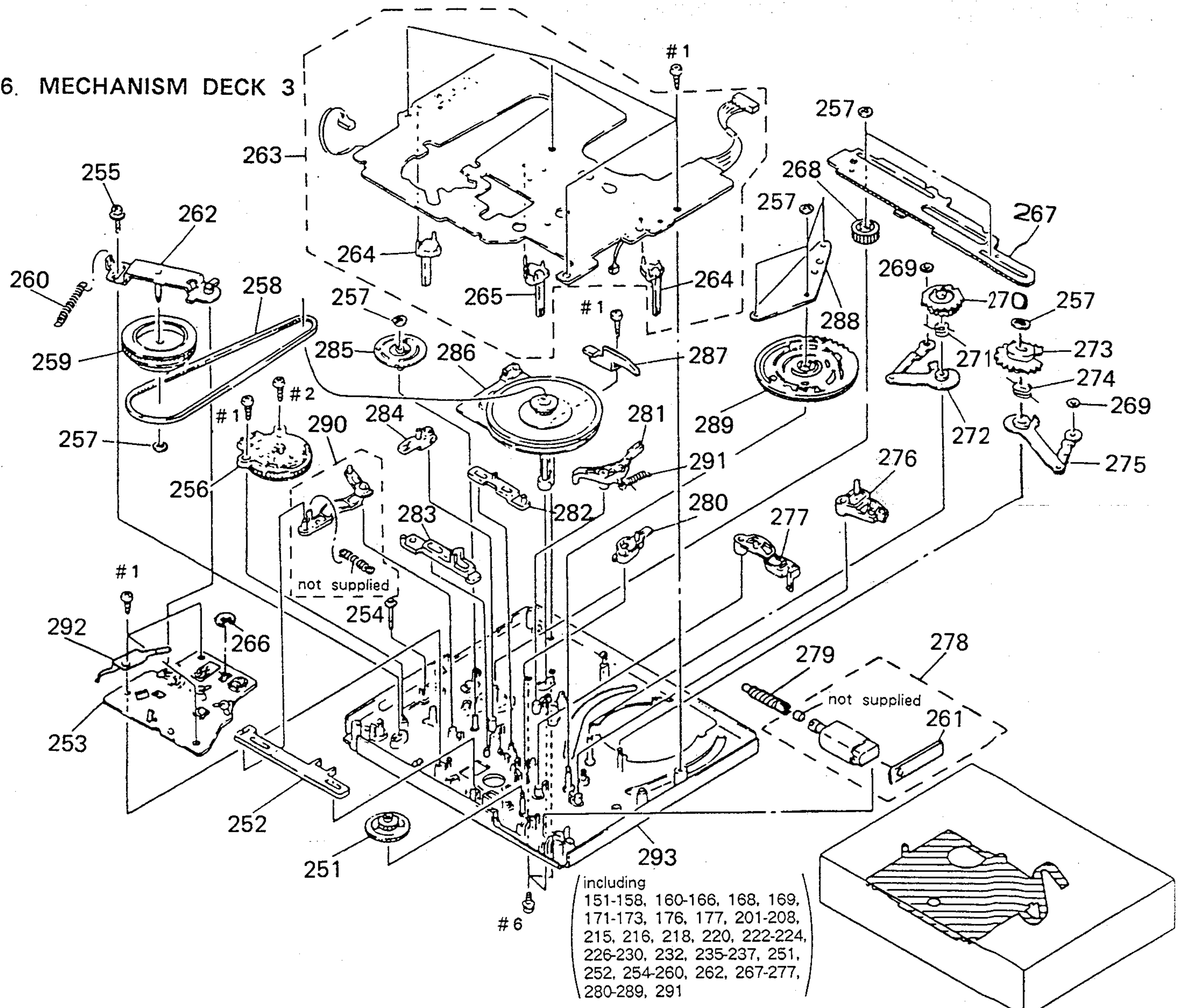
223

Ref. No.	Part No.	Description	Remark
201	A-6759-483-A	TAKE-UP BLOCK ASSY (AT), S	
202	3-736-151-11	ARM (POM), TENSION REGULATOR	
203	3-738-212-21	RETAINER, THRUST, REEL TABLE	
204	X-3749-193-2	TABLE ASSY (S), REEL, S	
205	X-3743-517-1	LEVER (S), RELEASE, C ROLLER	
206	X-3727-797-1	BAND ASSY, TENSION REGULATOR	
207	X-3727-786-1	SHUTTLE (LEFT) ASSY	
208	X-3733-301-1	ROLLER ASSY, GUIDE	
209	X-3727-767-1	BASE ASSY, STABILIZER	
210	1-543-647-11	HEAD, FE	
211	3-736-082-01	RETAINER, TS THRUST	
212	3-741-925-01	RING, RETAINING	
213	X-3727-771-1	STABLILIZER ASSY, TAPE	
214	8-848-537-11	DRUM ASSY DZH-21A-R (M901)	
215	3-738-284-01	SPRING, TENSION	
216	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
217	A-6761-129-C	HEAD BLOCK ASSY, ACE	
218	3-736-024-01	SPRING, TENSION	
* 219	1-634-678-11	DS-51 BOARD	
220	X-3729-926-1	BRAKE ASSY (2), T	
221	2-643-205-01	SCREW, FITTING +3X8, UPPER DRUM	
222	X-3733-336-2	BRAKE ASSY (2) (AT), S	
223	3-736-073-01	SLIDER, POLYETHYLENE	
224	X-3727-791-2	BASE ASSY, DRUM	
225	3-736-055-01	SCREW (3X8), TAPPING	
226	3-736-075-01	BRAKE, S SOFT	
227	3-944-033-01	FLANGE, 7 GUIDE	
228	3-736-730-01	SLEEVE, #7 GUIDE	
229	3-749-099-01	SPRING (#7 GUIDE), COMPRESSION	
230	X-3727-787-1	SHUTTLE (RIGHT) ASSY	
231	X-3727-788-1	ROLLER ASSY, GUIDE, #2	
232	3-736-745-01	SPRING	
233	A-6747-267-A	ARM BLOCK ASSY (S), C ROLLER	
234	8-848-540-01	UPPER DRUM ASSY (DZR-21-R)	
235	3-738-220-01	SPRING (MAIN BRAKE 2), TENSION	
236	3-738-221-01	SPRING (MAIN BRAKE 1), TENSION	
237	3-736-047-01	SPRING (S SOFT), TENSION	
* 238	3-738-249-01	PLATE, FIXED, MD	
DW001	1-809-495-11	SENSER, DEW CONDENSATION	

5-6. MECHANISM DECK 3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#6

including
151-158, 160-166, 168, 169,
171-173, 176, 177, 201-208,
215, 216, 218, 220, 222-224,
226-230, 232, 235-237, 251,
252, 254-260, 262, 267-277,
280-289, 291

Ref. No.	Part No.	Description	Remark
251	3-736-015-01	WHEEL (CAM), WORM	
252	3-736-158-01	PLATE, SLIDE, PENDULUM	
253	A-6739-084-A	CHASSIS BLOCK ASSY, SUB	
254	3-736-091-01	PIN, SWITCH	
255	3-733-386-01	SCREW (3X8), WASHER	
256	1-571-920-11	SWITCH, ROTARY	
257	3-669-595-00	WASHER (2), STOPPER	
258	3-736-013-01	BELT, TIMING	
259	X-3727-782-1	PULLEY ASSY	
260	3-736-089-01	SPRING, TENSION	
* 261	1-633-460-11	CA-41 BOARD	
262	X-3727-761-1	ARM ASSY, ADJUSTMENT	
* 263	A-6754-278-A	MD-49 BOARD, COMPLETE	
264	8-729-926-31	PHOTO TRANSISTOR PT483F1S (Q001, Q002)	
265	8-719-985-00	DIODE GL451VS1 (LED) (D001)	
266	3-669-465-00	WASHER (1.5), STOPPER	
267	3-736-177-01	PLATE, SLIDE, MODE	
268	3-733-394-01	GEAR, RVS RELAY	
269	3-736-073-01	SLIDER, POLYETHYLENE	
270	3-736-148-01	GEAR (RIGHT), THREADING	
271	3-736-092-01	SPRING (RIGHT), TORSION	
272	X-3727-777-1	ARM (RIGHT) ASSY, THREADING	
273	3-736-147-01	GEAR (LEFT), THREADING	
274	3-736-040-01	SPRING (LEFT), TORSION	
275	X-3727-778-1	ARM (LEFT) ASSY, THREADING	
276	3-736-142-01	ARM, TENSION REGULATOR FUNCTION	
277	3-736-140-01	ARM, S TAKE-UP	
278	X-3733-302-1	MOTOR ASSY, CAM (M903)	
279	3-733-395-01	GEAR (CAM), WORM	
280	3-733-397-01	ARM, BRAKE FUNCTION	
281	X-3733-338-1	BRAKE ASSY (AT), CAP	
282	3-733-398-01	PLATE, SLIDE, BRAKE	
283	3-736-103-01	PLATE, SLIDE, LIMITER	
284	3-736-016-01	ARM, LIMITER FUNCTION	
285	3-736-170-01	GEAR, RKB CAM	
286	8-835-394-11	MOTOR, DC U-26F (CAPSTAN) (M902)	
287	3-736-744-01	RETAINER, ROTOR	
288	3-733-396-01	HOLDER, CAM GEAR	
289	3-736-176-01	GEAR, CAM	
291	3-738-237-01	SPRING (CAP BRAKE), TENSION	
290	X-3729-924-1	ARM, PENDULUM FUNCTION	
292	3-741-950-01	SPRING (AT), LEAF, SC GROUND	
* 293	A-6773-084-A	MD BLOCK ASSY	

AO-24

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA....: μA...., uPA....: μPA....
  uPB....: μPB...., uPC....: μPC....
  uPD....: μPD....
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
*	A-6756-297-A	AO-24 BOARD, COMPLETE			
		**********************			
		(Ref. No 1,000 Series)			
		< CAPACITOR >			
C601	1-164-098-11	CERAMIC	0.047uF		12V
C605	1-162-306-11	CERAMIC	0.01uF	20%	16V
C606	1-162-205-31	CERAMIC	18PF	5%	50V
C607	1-162-203-31	CERAMIC	15PF	5%	50V
C608	1-162-207-31	CERAMIC	22PF	5%	50V
C609	1-162-209-31	CERAMIC	27PF	5%	50V
C610	1-162-199-31	CERAMIC	10PF	5%	50V
C611	1-162-199-31	CERAMIC	10PF	5%	50V
C613	1-162-211-31	CERAMIC	33PF	5%	50V
C618	1-124-443-00	ELECT	100uF	20%	10V
C620	1-124-907-11	ELECT	10uF	20%	50V
C622	1-124-126-00	ELECT	47uF	20%	10V
C623	1-124-927-11	ELECT	4.7uF	20%	100V
C651	1-162-306-11	CERAMIC	0.01uF	20%	16V
C652	1-162-291-31	CERAMIC	560PF	10%	50V
C653	1-124-903-11	ELECT	1uF	20%	50V
C654	1-130-487-00	MYLAR	0.022uF	5%	50V
C655	1-164-083-11	CERAMIC	680PF	10%	50V
C656	1-102-980-00	CERAMIC	270PF	5%	50V
C657	1-102-980-00	CERAMIC	270PF	5%	50V
C658	1-162-306-11	CERAMIC	0.01uF	20%	16V
C659	1-124-126-00	ELECT	47uF	20%	10V
C660	1-162-306-11	CERAMIC	0.01uF	20%	16V
C901	1-136-558-11	FILM	0.0039uF	10%	630V
C902	1-109-675-11	MICA	120PF	1%	500V
C903	1-124-477-11	ELECT	47uF	20%	25V
C904	1-161-051-00	CERAMIC	0.01uF	10%	50V
C905	1-164-087-11	CERAMIC	0.0015uF	10%	50V
C906	1-124-903-11	ELECT	1uF	20%	50V
C907	1-164-077-11	CERAMIC	220PF	10%	50V
C909	1-124-477-11	ELECT	47uF	20%	25V
C910	1-124-477-11	ELECT	47uF	20%	25V
C912	1-124-477-11	ELECT	47uF	20%	25V
C913	1-164-085-11	CERAMIC	0.001uF	10%	50V
C914	1-124-903-11	ELECT	1uF	20%	50V
C915	1-164-092-11	CERAMIC	0.0033uF	10%	25V
C917	1-124-252-00	ELECT	0.33uF	20%	50V
C918	1-124-907-11	ELECT	10uF	20%	50V
C919	1-124-477-11	ELECT	47uF	20%	25V
C920	1-136-153-00	FILM	0.01uF	5%	50V
C921	1-124-903-11	ELECT	1uF	20%	50V
C922	1-124-903-11	ELECT	1uF	20%	50V
C923	1-161-055-00	CERAMIC	0.022uF	10%	50V
C924	1-164-078-11	CERAMIC	270PF	10%	50V
C925	1-164-085-11	CERAMIC	0.001uF	10%	50V
C926	1-126-233-11	ELECT	22uF	20%	50V
C927	1-161-054-00	CERAMIC	0.018uF	10%	25V
C929	1-124-927-11	ELECT	4.7uF	20%	100V
C947	1-161-051-00	CERAMIC	0.01uF	10%	50V
C951	1-161-051-00	CERAMIC	0.01uF	10%	50V
		< CONNECTOR >			
* CN601	1-563-258-11	SOCKET, CONNECTOR 15P			
CN951	1-506-483-21	CONNECTOR 4P, MALE			
* CN952	1-563-464-11	SOCKET, CONNECTOR 10P			
CN953	1-506-482-11	CONNECTOR 3P, MALE			
CN954	1-506-482-11	CONNECTOR 3P, MALE			
		< IC >			
IC601	8-759-634-22	IC M50554-182SP			
IC602	8-759-996-03	IC LVA519S			
IC901	8-759-805-20	IC LA7297			

< COIL >

Ref. No.	Part No.	Description	Remark
L601	1-412-751-11	INDUCTOR 18mH	
L602	1-410-521-11	INDUCTOR 100uH	
L603	1-410-521-11	INDUCTOR 100uH	
L604	1-410-515-11	INDUCTOR 33uH	
L605	1-410-521-11	INDUCTOR 100uH	
L607	1-410-521-11	INDUCTOR 100uH	
L608	1-410-521-11	INDUCTOR 100uH	
L901	1-410-120-11	INDUCTOR 1.2mH	
L902	1-410-091-31	INDUCTOR 22mH	
L903	1-410-089-11	INDUCTOR 15mH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q602	8-729-423-36	TRANSISTOR 2SC3311A-S	
Q603	8-729-900-89	TRANSISTOR DTC144ES	
Q604	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q605	8-729-423-36	TRANSISTOR 2SC3311A-S	
Q606	8-729-900-65	TRANSISTOR DTA144ES	
Q607	8-729-423-36	TRANSISTOR 2SC3311A-S	
Q608	8-729-900-89	TRANSISTOR DTC144ES	
Q901	8-729-140-96	TRANSISTOR 2SD774-34	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R601	1-249-421-11	CARBON 2.2K 5%	1/4W
R602	1-249-413-11	CARBON 470 5%	1/4W
R603	1-249-423-11	CARBON 3.3K 5%	1/4W
R604	1-249-417-11	CARBON 1K 5%	1/4W
R605	1-249-421-11	CARBON 2.2K 5%	1/4W
R606	1-249-416-11	CARBON 820 5%	1/4W
R607	1-249-423-11	CARBON 3.3K 5%	1/4W
R608	1-249-424-11	CARBON 3.9K 5%	1/4W
R609	1-249-413-11	CARBON 470 5%	1/4W
R610	1-249-413-11	CARBON 470 5%	1/4W
R611	1-249-429-11	CARBON 10K 5%	1/4W
R613	1-249-437-11	CARBON 47K 5%	1/4W
R614	1-247-897-11	CARBON 560K 5%	1/4W
R615	1-249-413-11	CARBON 470 5%	1/4W
R616	1-249-431-11	CARBON 15K 5%	1/4W
R617	1-249-423-11	CARBON 3.3K 5%	1/4W
R618	1-249-414-11	CARBON 560 5%	1/4W
R620	1-249-429-11	CARBON 10K 5%	1/4W
R629	1-249-424-11	CARBON 3.9K 5%	1/4W
R630	1-249-422-11	CARBON 2.7K 5%	1/4W
R651	1-249-414-11	CARBON 560 5%	1/4W
R652	1-249-430-11	CARBON 12K 5%	1/4W
R653	1-249-434-11	CARBON 27K 5%	1/4W
R654	1-249-422-11	CARBON 2.7K 5%	1/4W
R655	1-249-429-11	CARBON 10K 5%	1/4W
R656	1-249-429-11	CARBON 10K 5%	1/4W
R657	1-247-903-00	CARBON 1M 5%	1/4W
R660	1-249-417-11	CARBON 1K 5%	1/4W
R663	1-249-425-11	CARBON 4.7K 5%	1/4W
R664	1-249-406-11	CARBON 120 5%	1/4W
R665	1-249-426-11	CARBON 5.6K 5%	1/4W
R666	1-249-411-11	CARBON 330 5%	1/4W
R667	1-249-413-11	CARBON 470 5%	1/4W
R668	1-249-413-11	CARBON 470 5%	1/4W
R669	1-249-429-11	CARBON 10K 5%	1/4W
R670	1-249-425-11	CARBON 4.7K 5%	1/4W
R901	1-249-432-11	CARBON 18K 5%	1/4W
R902	1-249-429-11	CARBON 10K 5%	1/4W
⚠R903	1-249-387-11	CARBON 3.3 5%	1/4W
R904	1-249-429-11	CARBON 10K 5%	1/4W
R905	1-249-429-11	CARBON 10K 5%	1/4W
R907	1-249-426-11	CARBON 5.6K 5%	1/4W
R908	1-249-393-11	CARBON 10 5%	1/4W
R909	1-249-429-11	CARBON 10K 5%	1/4W
R910	1-247-883-00	CARBON 150K 5%	1/4W
R911	1-249-429-11	CARBON 10K 5%	1/4W
R912	1-249-413-11	CARBON 470 5%	1/4W
R913	1-247-887-00	CARBON 220K 5%	1/4W
R914	1-249-411-11	CARBON 330 5%	1/4W
R915	1-249-429-11	CARBON 10K 5%	1/4W
R916	1-249-436-11	CARBON 39K 5%	1/4W
R917	1-249-437-11	CARBON 47K 5%	1/4W
R918	1-249-410-11	CARBON 270 5%	1/4W
R919	1-249-420-11	CARBON 1.8K 5%	1/4W
R920	1-247-838-00	CARBON 2K 5%	1/4W
R921	1-249-422-11	CARBON 2.7K 5%	1/4W
R922	1-249-427-11	CARBON 6.8K 5%	1/4W
R923	1-247-903-00	CARBON 1M 5%	1/4W
R925	1-249-432-11	CARBON 18K 5%	1/4W
R926	1-249-429-11	CARBON 10K 5%	1/4W
R927	1-249-434-11	CARBON 27K 5%	1/4W
R928	1-249-429-11	CARBON 10K 5%	1/4W
R929	1-249-429-11	CARBON 10K 5%	1/4W
R930	1-249-429-11	CARBON 10K 5%	1/4W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV651	1-241-629-11	RES, ADJ, CARBON 4.7K (OSD ADJ)	
RV901	1-238-551-11	RES, ADJ, CARBON 220K (REC BIAS)	

< TRANSFORMER >

Ref. No.	Part No.	Description	Remark
T901	1-433-330-11	TRANSFORMER, BIAS OSCILLATION	

The components identified by
mark ⚠ or dotted line with mark
⚠ are critical for safety.
Replace only with part number
specified.

Ref. No.	Part No.	Description	Remark

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X601	1-577-289-11	VIBRATOR, CRYSTAL (17.7MHz)	

****

* 1-633-460-11 CA-41 BOARD (Ref.No 1,000 Series)
****

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN001	1-506-482-11	PIN CONNECTOR 3P	

****

CM-14 BOARD (Ref.No 2,000 Series)
****

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN001	1-506-482-11	PIN CONNECTOR 3P	

****

* 1-634-678-11 DS-51 BOARD (Ref.No 3,000 Series)
****

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN101	1-506-482-11	CONNECTOR 3P, MALE	

< DEW SENSER >

Ref. No.	Part No.	Description	Remark
DW001	1-809-495-11	SENSER, DEW CONDENSATION	

****

* A-6756-301-A MA-130 BOARD, COMPLETE (383)
****

* A-6756-296-A MA-130 BOARD, COMPLETE (X55ME)
****

* A-6756-299-A MA-130 BOARD, COMPLETE (X55DH)
****

(Ref. No 1,000 Series)

Ref. No.	Part No.	Description	Remark
	1-555-110-00	CABLE, PIN	
	3-682-057-11	SPACER (SMALL)	

< CAPACITOR >

Ref. No.	Part No.	Description				Remark
C101	1-102-978-00	CERAMIC	220PF	5%	50V	
C102	1-164-093-11	CERAMIC	0.0047uF	10%	25V	
C103	1-162-839-11	CERAMIC	0.01uF	10%	16V	
C104	1-164-085-11	CERAMIC	0.001uF	10%	50V	
C105	1-124-903-11	ELECT	1uF	20%	50V	
C106	1-164-054-11	CERAMIC	22PF	5%	50V	
C109	1-126-233-11	ELECT	22uF	20%	50V	
C110	1-126-233-11	ELECT	22uF	20%	50V	
C111	1-164-096-11	CERAMIC	0.01uF		50V	
C112	1-126-233-11	ELECT	22uF	20%	50V	
C113	1-124-443-00	ELECT	100uF	20%	10V	
C114	1-124-472-11	ELECT	470uF	20%	10V	
C115	1-124-477-11	ELECT	47uF	20%	25V	
C116	1-124-925-11	ELECT	2.2uF	20%	100V	
C117	1-124-925-11	ELECT	2.2uF	20%	100V	
C118	1-126-233-11	ELECT	22uF	20%	50V	
C119	1-164-096-11	CERAMIC	0.01uF		50V	
C120	1-124-925-11	ELECT	2.2uF	20%	100V	
C121	1-124-925-11	ELECT	2.2uF	20%	100V	
C122	1-164-054-11	CERAMIC	22PF	5%	50V	
C123	1-124-903-11	ELECT	1uF	20%	50V	
C124	1-164-093-11	CERAMIC	0.0047uF	10%	25V	
C126	1-162-851-11	CERAMIC	0.1uF	10%	16V	
C401	1-126-233-11	ELECT	22uF	20%	50V	
C402	1-130-491-00	MYLAR	0.047uF	5%	50V	
C403	1-161-379-00	CERAMIC	0.01uF	20%	25V	
C404	1-124-925-11	ELECT	2.2uF	20%	100V	
C405	1-124-907-11	ELECT	10uF	20%	50V	
C406	1-130-487-00	MYLAR	0.022uF	5%	50V	
C407	1-126-233-11	ELECT	22uF	20%	50V	
C408	1-124-443-00	ELECT	100uF	20%	10V	
C409	1-162-827-11	CERAMIC	0.001uF	10%	16V	
C410	1-161-043-00	CERAMIC	0.0022uF	10%	50V	
C411	1-164-098-11	CERAMIC	0.047uF		12V	
C412	1-124-126-00	ELECT	47uF	20%	10V	
C413	1-162-849-11	CERAMIC	0.068uF	10%	16V	
C414	1-126-233-11	ELECT	22uF	20%	50V	
C416	1-162-851-11	CERAMIC	0.1uF	10%	16V	
C417	1-124-925-11	ELECT	2.2uF	20%	100V	
C418	1-162-851-11	CERAMIC	0.1uF	10%	16V	
C419	1-124-126-00	ELECT	47uF	20%	10V	
C420	1-126-101-11	ELECT	100uF	20%	16V	
C421	1-126-101-11	ELECT	100uF	20%	16V	
C422	1-164-098-11	CERAMIC	0.047uF		12V	
C423	1-162-839-11	CERAMIC	0.01uF	10%	16V	
C424	1-164-058-11	CERAMIC	33PF	5%	50V	
C426	1-164-081-11	CERAMIC	470PF	10%	50V	
C427	1-164-076-11	CERAMIC	180PF	10%	50V	
C429	1-162-839-11	CERAMIC	0.01uF	10%	16V	
C430	1-162-851-11	CERAMIC	0.1uF	10%	16V	
C431	1-126-157-11	ELECT	10uF	20%	16V	
C432	1-124-927-11	ELECT	4.7uF	20%	100V	
C440	1-164-079-11	CERAMIC	330PF	10%	50V	
C471	1-162-839-11	CERAMIC	0.01uF	10%	16V	
C472	1-162-209-31	CERAMIC	27PF	5%	50V	
C473	1-164-081-11	CERAMIC	470PF	10%	50V	

Ref. No.	Part No.	Description			Remark
C501	1-162-839-11	CERAMIC	0.01uF	10%	16V
C502	1-162-839-11	CERAMIC	0.01uF	10%	16V
C503	1-164-087-11	CERAMIC	0.0015uF	10%	50V
C504	1-164-052-11	CERAMIC	18PF	5%	50V
C505	1-164-052-11	CERAMIC	18PF	5%	50V
C506	1-162-839-11	CERAMIC	0.01uF	10%	16V
C507	1-162-851-11	CERAMIC	0.1uF	10%	16V
C508	1-124-471-00	ELECT	1000uF	20%	6.3V
C508	1-124-893-11	ELECT	2200uF	20%	10V (383)
C509	1-162-847-11	CERAMIC	0.047uF	10%	16V
C520	1-126-233-11	ELECT	22uF	20%	50V
C701	1-124-034-51	ELECT	33uF	20%	16V
C702	1-130-495-00	MYLAR	0.1uF	5%	50V
C705	1-130-489-00	MYLAR	0.033uF	5%	50V
C706	1-130-489-00	MYLAR	0.033uF	5%	50V
C707	1-130-495-00	MYLAR	0.1uF	5%	50V
C708	1-124-907-11	ELECT	10uF	20%	50V
C709	1-101-361-00	CERAMIC	150PF	5%	50V
C716	1-124-907-11	ELECT	10uF	20%	50V (383)
C717	1-124-907-11	ELECT	10uF	20%	50V
C718	1-124-907-11	ELECT	10uF	20%	50V
C720	1-124-907-11	ELECT	10uF	20%	50V
C721	1-124-034-51	ELECT	33uF	20%	16V
C722	1-162-851-11	CERAMIC	0.1uF	10%	16V
C723	1-124-034-51	ELECT	33uF	20%	16V
C724	1-162-851-11	CERAMIC	0.1uF	10%	16V
C730	1-126-233-11	ELECT	22uF	20%	50V
C732	1-162-827-11	CERAMIC	0.001uF	10%	16V
C733	1-164-095-11	CERAMIC	0.01uF	10%	16V
C734	1-164-081-11	CERAMIC	470PF	10%	50V
C735	1-161-327-00	CERAMIC	0.0033uF	30%	16V
C736	1-161-327-00	CERAMIC	0.0033uF	30%	16V
C737	1-164-085-11	CERAMIC	0.001uF	10%	50V
C738	1-124-907-11	ELECT	10uF	20%	50V
C739	1-164-091-11	CERAMIC	0.0022uF	10%	50V
		< CONNECTOR >			
CN101	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P			
CN102	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P			
CN103	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
* CN104	1-506-744-11	PIN, CONNECTOR 15P			
* CN105	1-506-744-11	PIN, CONNECTOR 15P			
* CN106	1-506-981-11	PIN, CONNECTOR 10P			
* CN107	1-506-744-11	PIN, CONNECTOR 15P			
CN108	1-569-344-11	CONNECTOR, BOARD TO BOARD 19P			
CN109	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN301	1-506-468-11	CONNECTOR 3P, MALE			

Ref. No.	Part No.	Description	Remark
		< JACK >	
CNJ001	1-568-185-21	JACK, PIN 4P (LINE IN/OUT)	
		< DIODE >	
D101	8-719-911-19	DIODE 1SS119	
D103	8-719-911-19	DIODE 1SS119	
D401	8-719-101-50	DIODE RD5.1E-L2	
D501	8-719-200-82	DIODE 11ES2	
D502	8-719-911-19	DIODE 1SS119	
D505	8-719-911-19	DIODE 1SS119	
D506	8-719-911-19	DIODE 1SS119	
D701	8-759-157-40	IC uPC574J	
D702	8-719-911-19	DIODE 1SS119	
D703	8-719-911-19	DIODE 1SS119	
		< IC >	
IC101	8-759-511-44	IC LVA522SA	
IC102	8-759-927-56	IC BA7021	
IC401	8-759-938-12	IC BA10324	
IC402	8-759-246-14	IC TA8823N	
⚠IC403	8-759-983-45	IC BA6238A	
IC501	8-752-833-82	IC CXP80724-016Q	
IC502	8-759-996-59	IC CAT35C102P	
		< COIL >	
L101	1-410-509-11	INDUCTOR 10uH	
L102	1-410-501-11	INDUCTOR 2.2uH	
L401	1-410-513-11	INDUCTOR 22uH	
L402	1-408-409-00	INDUCTOR 10uH	
L403	1-408-413-00	INDUCTOR 22uH	
L503	1-410-509-11	INDUCTOR 10uH	
L701	1-410-521-11	INDUCTOR 100uH	
L702	1-410-521-11	INDUCTOR 100uH	
L703	1-408-409-00	INDUCTOR 10uH	
L704	1-408-409-00	INDUCTOR 10uH	
L705	1-410-509-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q101	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q102	8-729-900-89	TRANSISTOR DTC144ES	
Q106	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q401	8-729-601-47	TRANSISTOR 2SK381-B	
Q402	8-729-601-47	TRANSISTOR 2SK381-B	
Q403	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q404	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q405	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q406	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q407	8-729-423-37	TRANSISTOR 2SC3311A-QRS	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

MA-130

Ref. No.	Part No.	Description	Remark
Q410	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q415	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q416	8-729-900-65	TRANSISTOR DTA144ES	
Q417	8-729-900-65	TRANSISTOR DTA144ES	
Q418	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q419	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q701	8-729-422-57	TRANSISTOR UN4111	
Q703	8-729-422-57	TRANSISTOR UN4111	
Q705	8-729-422-57	TRANSISTOR UN4111	
Q707	8-729-422-57	TRANSISTOR UN4111 (383)	
Q709	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q710	8-729-281-52	TRANSISTOR 2SC1815-Y	
Q714	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q715	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q717	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q718	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q719	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q720	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q721	8-729-900-89	TRANSISTOR DTC144ES	
		< RESISTOR >	
R101	1-249-429-11	CARBON 10K 5%	1/4W
R102	1-247-903-00	CARBON 1M 5%	1/4W
R103	1-249-435-11	CARBON 33K 5%	1/4W
R104	1-249-419-11	CARBON 1.5K 5%	1/4W
R105	1-249-422-11	CARBON 2.7K 5%	1/4W
R106	1-249-429-11	CARBON 10K 5%	1/4W
R107	1-249-435-11	CARBON 33K 5%	1/4W
R108	1-249-441-11	CARBON 100K 5%	1/4W
R114	1-249-422-11	CARBON 2.7K 5%	1/4W
R115	1-249-405-11	CARBON 100 5%	1/4W
R116	1-249-441-11	CARBON 100K 5%	1/4W
R117	1-249-441-11	CARBON 100K 5%	1/4W
R118	1-249-441-11	CARBON 100K 5%	1/4W
R119	1-249-411-11	CARBON 330 5%	1/4W
R121	1-249-406-11	CARBON 120 5%	1/4W
R122	1-249-406-11	CARBON 120 5%	1/4W
R123	1-249-403-11	CARBON 68 5%	1/4W
R125	1-249-404-00	CARBON 82 5%	1/4W
R126	1-249-435-11	CARBON 33K 5%	1/4W
R127	1-249-417-11	CARBON 1K 5%	1/4W
R128	1-249-417-11	CARBON 1K 5%	1/4W
R130	1-249-421-11	CARBON 2.2K 5%	1/4W
R401	1-249-441-11	CARBON 100K 5%	1/4W
R402	1-249-432-11	CARBON 18K 5%	1/4W
R403	1-249-417-11	CARBON 1K 5%	1/4W
R404	1-249-441-11	CARBON 100K 5%	1/4W
R405	1-249-436-11	CARBON 39K 5%	1/4W
R406	1-249-429-11	CARBON 10K 5%	1/4W
R407	1-249-427-11	CARBON 6.8K 5%	1/4W
R408	1-249-430-11	CARBON 12K 5%	1/4W
R409	1-249-431-11	CARBON 15K 5%	1/4W
R410	1-249-429-11	CARBON 10K 5%	1/4W
R411	1-249-429-11	CARBON 10K 5%	1/4W
R412	1-249-429-11	CARBON 10K 5%	1/4W
R413	1-249-423-11	CARBON 3.3K 5%	1/4W
R414	1-249-431-11	CARBON 15K 5%	1/4W
R415	1-249-415-11	CARBON 680 5%	1/4W
R416	1-249-441-11	CARBON 100K 5%	1/4W
R417	1-249-415-11	CARBON 680 5%	1/4W
R418	1-249-430-11	CARBON 12K 5%	1/4W
R419	1-249-431-11	CARBON 15K 5%	1/4W
R420	1-247-885-00	CARBON 180K 5%	1/4W
R421	1-249-429-11	CARBON 10K 5%	1/4W
R422	1-249-405-11	CARBON 100 5%	1/4W
R423	1-249-417-11	CARBON 1K 5%	1/4W
R424	1-249-417-11	CARBON 1K 5%	1/4W
R425	1-249-425-11	CARBON 4.7K 5%	1/4W
R426	1-249-437-11	CARBON 47K 5%	1/4W
R427	1-249-441-11	CARBON 100K 5%	1/4W
R428	1-249-435-11	CARBON 33K 5%	1/4W
R429	1-249-411-11	CARBON 330 5%	1/4W
R430	1-249-425-11	CARBON 4.7K 5%	1/4W
R431	1-249-439-11	CARBON 68K 5%	1/4W
R432	1-249-441-11	CARBON 100K 5%	1/4W
R433	1-247-901-11	CARBON 820K 5%	1/4W
⚠R434	1-249-410-11	CARBON 270 5%	1/4W
R438	1-249-429-11	CARBON 10K 5%	1/4W
R439	1-249-429-11	CARBON 10K 5%	1/4W
R440	1-249-429-11	CARBON 10K 5%	1/4W
R441	1-249-429-11	CARBON 10K 5%	1/4W
R442	1-249-413-11	CARBON 470 5%	1/4W
R443	1-249-437-11	CARBON 47K 5%	1/4W
R444	1-249-437-11	CARBON 47K 5%	1/4W
R445	1-249-437-11	CARBON 47K 5%	1/4W
R446	1-249-437-11	CARBON 47K 5%	1/4W
R447	1-249-437-11	CARBON 47K 5%	1/4W
R448	1-249-437-11	CARBON 47K 5%	1/4W
R449	1-249-431-11	CARBON 15K 5%	1/4W
R450	1-249-417-11	CARBON 1K 5%	1/4W
R451	1-249-418-11	CARBON 1.2K 5%	1/4W
R452	1-249-430-11	CARBON 12K 5%	1/4W
R453	1-249-417-11	CARBON 1K 5%	1/4W
R454	1-249-417-11	CARBON 1K 5%	1/4W
R455	1-247-897-11	CARBON 560K 5%	1/4W
R456	1-249-421-11	CARBON 2.2K 5%	1/4W
R457	1-249-428-11	CARBON 8.2K 5%	1/4W
R458	1-249-421-11	CARBON 2.2K 5%	1/4W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R459	1-249-413-11	CARBON	470	5%	1/4W
R461	1-249-402-11	CARBON	56	5%	1/4W
R464	1-249-437-11	CARBON	47K	5%	1/4W
R465	1-249-427-11	CARBON	6.8K	5%	1/4W
R466	1-249-435-11	CARBON	33K	5%	1/4W
R467	1-249-429-11	CARBON	10K	5%	1/4W
R470	1-249-423-11	CARBON	3.3K	5%	1/4W
R471	1-249-437-11	CARBON	47K	5%	1/4W
R472	1-249-427-11	CARBON	6.8K	5%	1/4W
R473	1-249-412-11	CARBON	390	5%	1/4W
R474	1-249-405-11	CARBON	100	5%	1/4W
R475	1-249-428-11	CARBON	8.2K	5%	1/4W
R476	1-249-421-11	CARBON	2.2K	5%	1/4W
R477	1-249-425-11	CARBON	4.7K	5%	1/4W (X55ME)
R502	1-249-417-11	CARBON	1K	5%	1/4W
R503	1-249-417-11	CARBON	1K	5%	1/4W
R504	1-249-417-11	CARBON	1K	5%	1/4W
R505	1-249-417-11	CARBON	1K	5%	1/4W
R506	1-249-429-11	CARBON	10K	5%	1/4W
R507	1-249-429-11	CARBON	10K	5%	1/4W
R508	1-249-417-11	CARBON	1K	5%	1/4W
R510	1-249-417-11	CARBON	1K	5%	1/4W
R511	1-249-417-11	CARBON	1K	5%	1/4W
R512	1-249-429-11	CARBON	10K	5%	1/4W
R513	1-249-428-11	CARBON	8.2K	5%	1/4W
R514	1-249-417-11	CARBON	1K	5%	1/4W
R515	1-249-437-11	CARBON	47K	5%	1/4W
R516	1-249-431-11	CARBON	15K	5%	1/4W
R517	1-249-417-11	CARBON	1K	5%	1/4W
R518	1-249-417-11	CARBON	1K	5%	1/4W
R519	1-249-417-11	CARBON	1K	5%	1/4W
R520	1-249-417-11	CARBON	1K	5%	1/4W
R521	1-249-417-11	CARBON	1K	5%	1/4W (383/X55DH)
R522	1-249-421-11	CARBON	2.2K	5%	1/4W
R523	1-249-405-11	CARBON	100	5%	1/4W
R524	1-249-421-11	CARBON	2.2K	5%	1/4W
R525	1-249-405-11	CARBON	100	5%	1/4W
R526	1-249-430-11	CARBON	12K	5%	1/4W
R527	1-249-417-11	CARBON	1K	5%	1/4W
R529	1-249-411-11	CARBON	330	5%	1/4W
R530	1-249-429-11	CARBON	10K	5%	1/4W (X55ME)
R530	1-249-430-11	CARBON	12K	5%	1/4W (X55DH)
R531	1-249-429-11	CARBON	10K	5%	1/4W (383/X55DH)
R531	1-249-430-11	CARBON	12K	5%	1/4W (X55ME)
R532	1-249-421-11	CARBON	2.2K	5%	1/4W
R533	1-249-417-11	CARBON	1K	5%	1/4W
R534	1-249-429-11	CARBON	10K	5%	1/4W (383/X55ME)

Ref. No.	Part No.	Description			Remark
R561	1-249-408-11	CARBON	180	5%	1/4W
R562	1-249-416-11	CARBON	820	5%	1/4W
R563	1-249-441-11	CARBON	100K	5%	1/4W
R701	1-249-429-11	CARBON	10K	5%	1/4W
R703	1-249-429-11	CARBON	10K	5%	1/4W
R704	1-249-429-11	CARBON	10K	5%	1/4W
R705	1-249-429-11	CARBON	10K	5%	1/4W (383)
R706	1-249-420-11	CARBON	1.8K	5%	1/4W
R707	1-247-891-00	CARBON	330K	5%	1/4W
R708	1-249-433-11	CARBON	22K	5%	1/4W
R709	1-249-433-11	CARBON	22K	5%	1/4W
R710	1-249-429-11	CARBON	10K	5%	1/4W
R711	1-249-429-11	CARBON	10K	5%	1/4W
R714	1-249-429-11	CARBON	10K	5%	1/4W
R728	1-249-417-11	CARBON	1K	5%	1/4W
R729	1-249-417-11	CARBON	1K	5%	1/4W
R730	1-249-405-11	CARBON	100	5%	1/4W
R731	1-249-417-11	CARBON	1K	5%	1/4W
R732	1-249-417-11	CARBON	1K	5%	1/4W
R733	1-249-428-11	CARBON	8.2K	5%	1/4W
R734	1-249-431-11	CARBON	15K	5%	1/4W
R737	1-249-404-00	CARBON	82	5%	1/4W
R738	1-249-437-11	CARBON	47K	5%	1/4W
R739	1-249-403-11	CARBON	68	5%	1/4W
R740	1-249-419-11	CARBON	1.5K	5%	1/4W
R741	1-249-435-11	CARBON	33K	5%	1/4W
R742	1-249-417-11	CARBON	1K	5%	1/4W
R743	1-249-433-11	CARBON	22K	5%	1/4W
R744	1-249-424-11	CARBON	3.9K	5%	1/4W
R751	1-249-429-11	CARBON	10K	5%	1/4W (X55DH)

< MODULATOR >

⚠RFU701	1-466-350-11	MODULATOR, RF (RFU-2018) (383/X55ME)
⚠RFU701	1-466-349-11	MODULATOR, RF (RFU-2019) (X55DH)

< VARIABLE RESISTOR >

RV501	1-241-632-11	RES, ADJ, CARBON 47K (SWP)

< TUNER >

⚠TU701	1-465-895-11	TUNER, VIF (BTF-3G401) (383)
⚠TU701	1-465-898-11	TUNER, VIF (BTF-3G501) (X55ME)
⚠TU701	1-465-896-11	TUNER, VIF (BTF-3G502) (X55DH)

< VIBRATOR >

X501	1-578-774-11	VIBRATOR, CRYSTAL (12MHz)

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

MD-49

Ref. No.	Part No.	Description			Remark
*	A-6754-278-A	MD-49 BOARD, COMPLETE			
		**********************			
		(Ref. No 4,000 Series)			
	1-691-643-11	CONNECTOR, BOARD TO BOARD			
*	2-387-601-01	CUSHION, RUBBER			
		< CAPACITOR >			
C001	1-161-494-00	CERAMIC	0.022uF		25V
C002	1-161-494-00	CERAMIC	0.022uF		25V
C003	1-126-157-11	ELECT	10uF	20%	16V
C004	1-161-379-00	CERAMIC	0.01uF	20%	25V
C005	1-126-157-11	ELECT	10uF	20%	16V
C006	1-124-589-11	ELECT	47uF	20%	16V
C008	1-164-159-11	CERAMIC	0.1uF		50V
C009	1-164-159-11	CERAMIC	0.1uF		50V
C011	1-162-849-11	CERAMIC	0.068uF	10%	16V
C012	1-162-849-11	CERAMIC	0.068uF	10%	16V
C013	1-162-849-11	CERAMIC	0.068uF	10%	16V
C014	1-126-160-11	ELECT	1uF	20%	50V
C016	1-124-589-11	ELECT	47uF	20%	16V
C017	1-126-162-11	ELECT	3.3uF	20%	50V
C018	1-124-589-11	ELECT	47uF	20%	16V
C019	1-124-589-11	ELECT	47uF	20%	16V
C020	1-161-379-00	CERAMIC	0.01uF	20%	25V
C021	1-162-292-31	CERAMIC	680PF	10%	50V
C027	1-162-294-31	CERAMIC	0.001uF	10%	50V
C028	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< CONNECTOR >			
CN001	1-506-494-11	PIN, CONNECTOR 15P			
CN002	1-569-335-11	CONNECTOR, BOARD TO BOARD 9P			
CN004	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN005	1-506-482-11	CONNECTOR 3P, MALE			
CN006	1-569-333-11	CONNECTOR, BOARD TO BOARD 3P			
CN007	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN008	1-506-482-11	CONNECTOR 3P, MALE			
		< DIODE >			
D001	8-719-985-00	DIODE GL451VS1			
D004	8-719-109-93	DIODE RD6.2ES-B2			
D005	8-719-109-93	DIODE RD6.2ES-B2			
D006	8-719-109-93	DIODE RD6.2ES-B2			
D007	8-719-109-93	DIODE RD6.2ES-B2			
		< IC >			
IC002	8-759-938-12	IC BA10324			
⚠IC004	8-759-234-03	IC TA8424F			

Ref. No.	Part No.	Description				Remark
		< PHOTO INTERUPTER >				
PH001	8-759-144-33	IC PS6002				
PH002	8-759-144-33	IC PS6002				
		< IC LINK >				
PS001	1-532-685-00	LINK, IC				
		< TRANSISTOR >				
Q001	8-729-926-31	TRANSISTOR PT483F1S				
Q002	8-729-926-31	TRANSISTOR PT483F1S				
		< RESISTOR >				
R001	1-249-423-11	CARBON	3.3K	5%	1/4W	
R002	1-249-423-11	CARBON	3.3K	5%	1/4W	
R003	1-249-426-11	CARBON	5.6K	5%	1/4W	
R004	1-249-426-11	CARBON	5.6K	5%	1/4W	
R005	1-249-417-11	CARBON	1K	5%	1/4W	
R006	1-249-441-11	CARBON	100K	5%	1/4W	
R007	1-249-441-11	CARBON	100K	5%	1/4W	
R008	1-249-425-11	CARBON	4.7K	5%	1/4W	
R009	1-249-409-11	CARBON	220	5%	1/4W	
R010	1-249-425-11	CARBON	4.7K	5%	1/4W	
R011	1-249-437-11	CARBON	47K	5%	1/4W	
R012	1-249-421-11	CARBON	2.2K	5%	1/4W	
R013	1-249-429-11	CARBON	10K	5%	1/4W	
R014	1-249-426-11	CARBON	5.6K	5%	1/4W	
R015	1-249-437-11	CARBON	47K	5%	1/4W	
R016	1-249-421-11	CARBON	2.2K	5%	1/4W	
⚠R019	1-249-377-11	CARBON	0.47	5%	1/4W	F
R020	1-249-406-11	CARBON	120	5%	1/4W	
R021	1-249-383-11	CARBON	1.5	5%	1/6W	
R022	1-249-408-11	CARBON	180	5%	1/4W	
R024	1-249-417-11	CARBON	1K	5%	1/4W	
R025	1-247-891-00	CARBON	330K	5%	1/4W	
R027	1-249-383-11	CARBON	1.5	5%	1/6W	
R028	1-249-383-11	CARBON	1.5	5%	1/6W	
		< SWITCH >				
S001	1-570-953-11	SWITCH, PUSH (1 KEY)				
S002	1-570-953-11	SWITCH, PUSH (1 KEY)				

****

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
*	A-6721-435-A	MF-156 BOARD, COMPLETE	
		***********************	
		(Ref. No 5,000 Series)	
	1-572-662-11	SWITCH, ROTARY	
	3-942-334-01	HOLDER, FL	
		< BUZZER >	
BZ001	1-529-070-11	BUZZER	
		< CAPACITOR >	
C001	1-164-159-11	CERAMIC 0. 1uF 50V	
C002	1-125-705-11	CAP, DOUBLE LAYERS 0. 22F	
C003	1-164-159-11	CERAMIC 0. 1uF 50V	
C004	1-164-056-11	CERAMIC 27PF 5% 50V	
C005	1-162-203-31	CERAMIC 15PF 5% 50V	
C006	1-126-096-11	ELECT 10uF 20% 35V	
C007	1-164-159-11	CERAMIC 0. 1uF 50V	
C008	1-162-282-31	CERAMIC 100PF 10% 50V	
C009	1-162-282-31	CERAMIC 100PF 10% 50V	
		< FILTER >	
CF001	1-577-101-11	VIBRATOR, CERAMIC (4. 19MHz)	
		< CONNECTOR >	
CN001	1-569-342-11	CONNECTOR, BOARD TO BOARD 19P	
CN002	1-568-666-11	CONNECTOR, BOARD TO BOARD 12P	
CN003	1-569-536-11	SOCKET, CONNECTOR 7P	
CN004	1-580-850-11	CONNECTOR (DMS) 8P	
		< DIODE >	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-200-82	DIODE 11ES2	
D003	8-719-110-08	DIODE RD8. 2ES-B2	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D006	8-719-911-19	DIODE 1SS119	
D007	8-719-911-19	DIODE 1SS119	
D008	8-719-313-07	DIODE SEL1810D-D (RENTAL PICTURE)	
D009	8-719-313-07	DIODE SEL1810D-D (NTSC PB)	
D010	8-719-109-72	DIODE RD3. 9ES-B2	
D011	8-719-109-97	DIODE RD6. 8ES-B2	
D012	8-719-109-97	DIODE RD6. 8ES-B2	
D013	8-719-109-97	DIODE RD6. 8ES-B2	
D014	8-719-109-97	DIODE RD6. 8ES-B2	
D015	8-719-109-97	DIODE RD6. 8ES-B2	
D016	8-719-109-97	DIODE RD6. 8ES-B2	
D017	8-719-109-97	DIODE RD6. 8ES-B2	
D018	8-719-911-19	DIODE 1SS119	
D019	8-719-109-97	DIODE RD6. 8ES-B2	
D020	8-719-109-97	DIODE RD6. 8ES-B2	
D021	8-719-109-97	DIODE RD6. 8ES-B2	
		< IC >	
IC001	8-752-830-95	IC CXP50116-247Q	
IC002	8-759-971-15	IC PST529H	
IC003	8-759-995-76	IC PST529C	
		< COIL >	
L001	1-410-522-11	INDUCTOR 120uH	
L002	1-410-522-11	INDUCTOR 120uH	
L003	1-410-501-11	INDUCTOR 2. 2uH	
L004	1-410-501-11	INDUCTOR 2. 2uH	
		< INDICATION TUBE >	
ND001	1-519-668-31	INDICATION TUBE, FLUORESCENT	
		< TRANSISTOR >	
Q001	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q002	8-729-423-37	TRANSISTOR 2SC3311A-QRS	
Q003	8-729-900-65	TRANSISTOR DTA144ES	
		< RESISTOR >	
R001	1-249-393-11	CARBON 10 5% 1/4W	
R002	1-247-895-00	CARBON 470K 5% 1/4W	
R003	1-247-887-00	CARBON 220K 5% 1/4W	
R005	1-249-417-11	CARBON 1K 5% 1/4W	
R006	1-249-413-11	CARBON 470 5% 1/4W	
R007	1-249-433-11	CARBON 22K 5% 1/4W	
R008	1-249-425-11	CARBON 4. 7K 5% 1/4W	
R012	1-249-411-11	CARBON 330 5% 1/4W	
R013	1-249-411-11	CARBON 330 5% 1/4W	
R014	1-249-433-11	CARBON 22K 5% 1/4W	
R015	1-249-433-11	CARBON 22K 5% 1/4W	
R016	1-249-433-11	CARBON 22K 5% 1/4W	
R017	1-249-433-11	CARBON 22K 5% 1/4W	
R020	1-249-433-11	CARBON 22K 5% 1/4W	
R021	1-249-433-11	CARBON 22K 5% 1/4W	
R022	1-249-433-11	CARBON 22K 5% 1/4W	
R023	1-249-433-11	CARBON 22K 5% 1/4W	
R024	1-249-433-11	CARBON 22K 5% 1/4W	
R025	1-249-433-11	CARBON 22K 5% 1/4W	
R026	1-249-433-11	CARBON 22K 5% 1/4W	
R027	1-249-433-11	CARBON 22K 5% 1/4W	
R028	1-249-433-11	CARBON 22K 5% 1/4W	
R029	1-249-433-11	CARBON 22K 5% 1/4W	
R030	1-249-433-11	CARBON 22K 5% 1/4W	
R031	1-249-429-11	CARBON 10K 5% 1/4W	

MF-156 MF-157 POWER

Ref. No.	Part No.	Description	Remark
R032	1-249-417-11	CARBON 1K 5%	1/4W
R033	1-249-417-11	CARBON 1K 5%	1/4W
R034	1-249-417-11	CARBON 1K 5%	1/4W
R035	1-249-417-11	CARBON 1K 5%	1/4W
R036	1-249-417-11	CARBON 1K 5%	1/4W
R037	1-249-417-11	CARBON 1K 5%	1/4W
R038	1-249-417-11	CARBON 1K 5%	1/4W
R040	1-249-405-11	CARBON 100 5%	1/4W
R041	1-249-405-11	CARBON 100 5%	1/4W
R042	1-249-405-11	CARBON 100 5%	1/4W
R043	1-249-405-11	CARBON 100 5%	1/4W
R044	1-249-405-11	CARBON 100 5%	1/4W
R045	1-249-405-11	CARBON 100 5%	1/4W
R046	1-249-405-11	CARBON 100 5%	1/4W
R047	1-249-437-11	CARBON 47K 5%	1/4W
R050	1-249-417-11	CARBON 1K 5%	1/4W
R061	1-249-417-11	CARBON 1K 5%	1/4W
R062	1-249-417-11	CARBON 1K 5%	1/4W
R063	1-249-433-11	CARBON 22K 5%	1/4W
		< SWITCH >	
S001	1-571-977-11	SWITCH, TACTIL (HI-SPEED REWIND)	
S002	1-571-977-11	SWITCH, TACTIL (PAUSE)	
		< VIBRATOR >	
X001	1-579-435-11	VIBRATOR, CRYSTAL (32.768kHz)	

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* A-6756-300-A MF-157 BOARD, COMPLETE (383)

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* A-6756-295-A MF-157 BOARD, COMPLETE (X55ME)

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* A-6756-298-A MF-157 BOARD, COMPLETE (X55DH)

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(Ref.No 1,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C051	1-162-284-31	CERAMIC 150PF 10%	50V
C053	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
CN051	1-568-672-11	CONNECTOR, BOARD TO BOARD 12P	
		< JACK >	
CNJ051	1-569-444-11	JACK, PIN 2P (VIDEO IN/OUT)	
		< DIODE >	
D051	8-719-303-02	DIODE SEL2510C-D (POWER)	
D052	8-719-303-02	DIODE SEL2510C-D (POWER)	
D054	8-719-911-19	DIODE 1SS119	
D055	8-719-911-19	DIODE 1SS119	
D058	8-719-911-19	DIODE 1SS119	
D059	8-719-109-97	DIODE RD6.8ES-B2	
D060	8-719-109-97	DIODE RD6.8ES-B2	
		< IC >	
IC051	1-466-131-21	IC GP1U52X	
		< COIL >	
L011	1-410-501-11	INDUCTOR 2.2uH	
		< RESISTOR >	
R051	1-249-404-00	CARBON 82 5%	1/4W
R052	1-249-405-11	CARBON 100 5%	1/4W
R053	1-249-417-11	CARBON 1K 5%	1/4W
R054	1-249-420-11	CARBON 1.8K 5%	1/4W
R055	1-249-409-11	CARBON 220 5%	1/4W
R056	1-249-409-11	CARBON 220 5%	1/4W
R057	1-249-423-11	CARBON 3.3K 5%	1/4W(X55ME)
R058	1-249-419-11	CARBON 1.5K 5%	1/4W
R070	1-249-425-11	CARBON 4.7K 5%	1/4W(X55DH)
R071	1-249-417-11	CARBON 1K 5%	1/4W(X55DH)
		< VARIABLE RESISTOR >	
RV051	1-241-209-11	RES, VAR, CARBON 10K (SHARPNESS)	
		< SWITCH >	
S052	1-571-977-11	SWITCH, TACTIL (POWER)	
S053	1-571-977-11	SWITCH, TACTIL (EJECT)	
S054	1-570-854-11	SWITCH, SLIDE (COLOUR SYSTEM) (X55ME)	
S054	1-570-865-11	SWITCH, SLIDE (COLOUR SYSTEM) (383/X55DH)	
S055	1-570-865-11	SWITCH, SLIDE (TV SYSTEM) (X55DH)	
S056	1-571-977-11	SWITCH, TACTIL (CL)	

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1-413-671-21 POWER BLOCK (Ref.No 5,000 Series)

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Ref. No.	Part No.	Description	Remark
	9-902-035-01	CLIP, FUSE	
	9-902-036-01	CLIP, FUSE	
		< CAPACITOR >	
⚠C101	1-130-711-11	MYLAR 0.22uF	AC250V
⚠C102	1-161-742-11	CERAMIC 2200PF 20%	AC250V
⚠C103	1-161-742-11	CERAMIC 2200PF 20%	AC250V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
⚠C104-1	1-162-599-12	CERAMIC	4700PF		AC250V
⚠C104-3	1-162-599-12	CERAMIC	4700PF		AC250V
C105	9-902-040-01	ELECT	180uF		400V
C106	9-998-870-01	CERAMIC	0.047uF		630V
C107	1-162-558-11	CERAMIC	100PF	10%	2KV
C108	1-124-634-11	ELECT	1uF	20%	200V
C109	1-124-478-11	ELECT	100uF	20%	25V
C111	1-130-491-00	MYLAR	0.047uF	5%	50V
C112	1-106-351-00	MYLAR	2200PF	5%	100V
⚠C115	9-902-039-11	MYLAR	0.1uF		AC250V
⚠C116-2	1-161-742-11	CERAMIC	2200PF	20%	AC250V
C201	1-124-120-11	ELECT	220uF	20%	16V
C202	9-998-877-01	ELECT	1500uF		25V
C203	1-124-120-11	ELECT	220uF	20%	16V
C205	1-124-120-11	ELECT	220uF	20%	16V
C206	1-124-472-11	ELECT	470uF	20%	10V
C207	1-124-444-11	ELECT	220uF	20%	10V
C208	1-124-757-51	ELECT	3300uF	20%	10V
C209	1-124-122-11	ELECT	100uF	20%	50V
C210	1-124-122-11	ELECT	100uF	20%	50V
C211	1-124-120-11	ELECT	1000uF	20%	10V
C212	1-130-483-00	MYLAR	0.01uF	5%	50V
C213	1-130-483-00	MYLAR	0.01uF	5%	50V
C214	9-998-884-01	MYLAR	0.33uF		63V
C215	1-124-477-11	ELECT	47uF	20%	25V
C216	1-124-902-11	ELECT	0.47uF	20%	50V
C218	9-998-888-01	CERAMIC	1000PF		1kV
C219	1-106-351-00	MYLAR	0.0022uF	5%	100V
		< CONNECTOR >			
⚠CN101	1-540-054-11	INLET, AC			
CN711	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
		< DIODE >			
⚠D101	8-719-510-06	DIODE S1WB60			
D103	8-719-913-44	DIODE ERA82-004			
D104-1	9-998-285-01	DIODE DIN60			
D104-2	9-998-285-01	DIODE DIN60			
D105	9-998-285-01	DIODE DIN60			
D110	9-998-285-01	DIODE DIN60			
D201	9-994-171-01	DIODE D4LA20			
D202	8-719-980-78	DIODE ERA83-006			
D203	8-719-110-57	DIODE RD22ES-B2			
D206	8-719-500-65	DIODE S3S6M			
D207	8-719-951-30	DIODE ERA91-02			
D208	8-719-951-30	DIODE ERA91-02			

Ref. No.	Part No.	Description			Remark
		< FUSE >			
⚠F101	1-532-203-11	FUSE, TIME-LAG T2A 250V			
		< HIC >			
⚠HIC101	9-900-265-01	HIC MA2831			
		< IC >			
⚠IC201	8-759-604-39	IC M5F78M12			
⚠IC202	8-759-420-19	IC AN1431T			
⚠IC203	8-759-513-73	IC PQ09RF11			
⚠IC204	8-749-920-43	IC SI-3050CA			
⚠IC205	1-808-796-11	IC SI-3120CS			
		< COIL >			
⚠L101	9-902-043-01	LINE FILTER 33mH 0.3A			
L201	9-902-034-01	CHOKE COIL 39uH			
L202	9-998-850-01	BEADS CORE			
		< PHOTO COUPLER >			
⚠PC101	8-719-939-00	PHOTO COUPLER PC111S			
		< IC LINK >			
PS201	1-532-637-11	LINK, IC ICP-N25			
PS202	1-532-637-11	LINK, IC ICP-N25			
		< TRANSISTOR >			
Q101	8-729-100-13	TRANSISTOR 2SC2001-K2			
		< RESISTOR >			
⚠R101	9-998-891-01	CEMENT	2.2		3W
⚠R102-1	1-215-929-11	METAL OXIDE	100K	5%	3W
⚠R102-2	1-215-929-11	METAL OXIDE	100K	5%	3W
R103-1	1-214-921-00	CARBON	220K	1%	1/2W
R103-2	1-214-921-00	CARBON	220K	1%	1/2W
R104-1	1-247-894-11	CARBON	430K	5%	1/4W
R104-2	1-247-894-11	CARBON	430K	5%	1/4W
⚠R105	1-214-852-00	CARBON	330	1%	1/2W F
⚠R106	1-212-978-11	CARBON	68	5%	1/2W F
⚠R107	1-212-982-00	CARBON	100	5%	1/2W F
R108-1	1-214-824-11	CARBON	22	1%	1/2W
R108-2	1-214-824-11	CARBON	22	1%	1/2W
R109	1-249-409-11	CARBON	220	5%	1/4W
R110	1-214-947-00	METAL	2.7M	1%	1/2W
⚠R201	1-247-741-11	CARBON	150	5%	1/2W F
⚠R203	1-212-972-00	FUSE	39	5%	1/2W F
⚠R204	1-249-476-11	CARBON	1.5	5%	1/2W F
⚠R205	1-247-735-11	CARBON	47	5%	1/2W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

POWER RP-140

Ref. No.	Part No.	Description			Remark
⚠R206	1-215-426-00	METAL	1.6K	1%	1/4W
⚠R207-1	1-215-425-00	METAL	1.5K	1%	1/4W
⚠R207-2	1-215-455-00	METAL	27K	1%	1/4W
⚠R208	1-215-413-00	METAL	470	1%	1/4W
R209	1-215-413-11	CARBON	470	5%	1/4W
⚠R212	1-215-399-00	METAL	120	1%	1/4W
R213	1-249-429-11	CARBON	10K	5%	1/4W
R214	1-247-820-11	CARBON	360	5%	1/4W
⚠R232	1-225-409-00	METAL	330	1%	1/4W

< TRANSFORMER >

⚠T101 9-902-030-01 TRANSFORMER, CONVERTER

< THERMISTOR >

⚠THY201 8-719-107-80 THYRISTOR 03P5MG

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* A-6727-382-A RP-140 BOARD, COMPLETE

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(Ref. No 1,000 Series)

	Part No.	Description
	3-682-057-11	SPACER (SMALL)
*	3-741-956-01	CASE (MAIN), SHIELD, RP
*	3-741-957-01	CASE (LID), SHIELD, RP
*	3-741-958-01	CASE (BOTTOM), SHIELD, RP

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C803	1-164-159-11	CERAMIC	0.1uF		50V
C804	1-164-159-11	CERAMIC	0.1uF		50V
C805	1-164-159-11	CERAMIC	0.1uF		50V
C806	1-164-159-11	CERAMIC	0.1uF		50V
C807	1-164-159-11	CERAMIC	0.1uF		50V
C808	1-126-154-11	ELECT	47uF	20%	6.3V
C809	1-124-464-11	ELECT	0.22uF	20%	50V
C810	1-124-464-11	ELECT	0.22uF	20%	50V
C811	1-124-464-11	ELECT	0.22uF	20%	50V
C812	1-124-464-11	ELECT	0.22uF	20%	50V
C813	1-162-211-31	CERAMIC	33PF	5%	50V
C815	1-162-211-31	CERAMIC	33PF	5%	50V
C820	1-162-217-31	CERAMIC	56PF	5%	50V
C827	1-162-207-31	CERAMIC	22PF	5%	50V
C830	1-162-306-11	CERAMIC	0.01uF	20%	16V
C831	1-162-306-11	CERAMIC	0.01uF	20%	16V
C832	1-124-903-11	ELECT	1uF	20%	50V
C833	1-162-306-11	CERAMIC	0.01uF	20%	16V
C834	1-162-289-31	CERAMIC	390PF	10%	50V
C835	1-161-327-00	CERAMIC	0.0033uF	20%	16V
C836	1-126-154-11	ELECT	47uF	20%	6.3V
C837	1-164-159-11	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description			Remark
C857	1-161-053-00	CERAMIC	0.015uF	10%	50V
C858	1-161-053-00	CERAMIC	0.015uF	10%	50V
C859	1-102-935-00	CERAMIC	2.0PF	+-0.25PF	50V
C861	1-161-053-00	CERAMIC	0.015uF	10%	50V
C864	1-164-159-11	CERAMIC	0.1uF		50V
C866	1-102-963-00	CERAMIC	33PF	5%	50V
C867	1-161-053-00	CERAMIC	0.015uF	10%	50V
C868	1-101-888-00	CERAMIC	68PF	5%	50V
C869	1-102-973-00	CERAMIC	100PF	5%	50V
C870	1-102-820-00	CERAMIC	330PF	5%	50V
C871	1-164-159-11	CERAMIC	0.1uF		50V
C872	1-124-126-00	ELECT	47uF	20%	10V
C873	1-164-159-11	CERAMIC	0.1uF		50V
C878	1-162-306-11	CERAMIC	0.01uF	20%	16V

< CONNECTOR >

Ref. No.	Part No.	Description
CN801	1-563-585-11	CONNECTOR, FLEXIBLE 8P
CN802	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P
* CN803	1-564-031-00	PIN, CONNECTOR 6P

< DIODE >

Ref. No.	Part No.	Description
D806	8-719-911-19	DIODE 1SS119
D808	8-719-911-19	DIODE 1SS119
D809	8-719-911-19	DIODE 1SS119

< IC >

IC802 8-759-320-52 IC HA118019NT

< COIL >

Ref. No.	Part No.	Description
L801	1-408-421-00	INDUCTOR 100uH
L803	1-408-421-00	INDUCTOR 100uH
L806	1-408-414-00	INDUCTOR 27uH
L807	1-408-412-00	INDUCTOR 18uH
L808	1-408-416-00	INDUCTOR 39uH
L810	1-408-411-00	INDUCTOR 15uH
L811	1-408-409-00	INDUCTOR 10uH
L812	1-408-424-00	INDUCTOR 180uH
L813	1-408-421-00	INDUCTOR 100uH
L820	1-408-409-00	INDUCTOR 10uH

< TRANSISTOR >

Ref. No.	Part No.	Description
Q801	8-729-900-89	TRANSISTOR DTC144ES
Q805	8-729-423-37	TRANSISTOR 2SC3311A-QRS
Q809	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q811	8-729-423-37	TRANSISTOR 2SC3311A-QRS
Q812	8-729-900-89	TRANSISTOR DTC144ES
Q813	8-729-423-37	TRANSISTOR 2SC3311A-QRS
Q814	8-729-900-89	TRANSISTOR DTC144ES
Q815	8-729-900-89	TRANSISTOR DTC144ES

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
Q820	8-729-900-89	TRANSISTOR DTC144ES				
Q821	8-729-900-65	TRANSISTOR DTA144ES				
Q822	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q823	8-729-900-89	TRANSISTOR DTC144ES				
Q824	8-729-900-89	TRANSISTOR DTC144ES				

< RESISTOR >

Ref. No.	Part No.	Description				Remark
R801	1-249-405-11	CARBON	100	5%	1/4W	
R802	1-249-429-11	CARBON	10K	5%	1/4W	
R809	1-249-409-11	CARBON	220	5%	1/4W	
R810	1-249-409-11	CARBON	220	5%	1/4W	
R811	1-249-405-11	CARBON	100	5%	1/4W	
R812	1-249-405-11	CARBON	100	5%	1/4W	
R820	1-249-413-11	CARBON	470	5%	1/4W	
R821	1-249-410-11	CARBON	270	5%	1/4W	
R822	1-249-417-11	CARBON	1K	5%	1/4W	
R826	1-249-432-11	CARBON	18K	5%	1/4W	
R827	1-249-433-11	CARBON	22K	5%	1/4W	
R828	1-249-429-11	CARBON	10K	5%	1/4W	
R829	1-249-429-11	CARBON	10K	5%	1/4W	
R830	1-247-895-00	CARBON	470K	5%	1/4W	
R831	1-249-420-11	CARBON	1.8K	5%	1/4W	
R832	1-249-429-11	CARBON	10K	5%	1/4W	
R833	1-249-429-11	CARBON	10K	5%	1/4W	
R845	1-249-416-11	CARBON	820	5%	1/4W	
R852	1-249-417-11	CARBON	1K	5%	1/4W	
R860	1-249-421-11	CARBON	2.2K	5%	1/4W	
R861	1-249-421-11	CARBON	2.2K	5%	1/4W	
R868	1-249-412-11	CARBON	390	5%	1/4W	
R869	1-249-412-11	CARBON	390	5%	1/4W	
R872	1-249-416-11	CARBON	820	5%	1/4W	
R876	1-249-421-11	CARBON	2.2K	5%	1/4W	
R877	1-249-426-11	CARBON	5.6K	5%	1/4W	
R878	1-249-414-11	CARBON	560	5%	1/4W	
R879	1-249-415-11	CARBON	680	5%	1/4W	
R880	1-249-413-11	CARBON	470	5%	1/4W	
R882	1-249-416-11	CARBON	820	5%	1/4W	
R884	1-249-417-11	CARBON	1K	5%	1/4W	
R886	1-249-418-11	CARBON	1.2K	5%	1/4W	
R888	1-249-422-11	CARBON	2.7K	5%	1/4W	
R889	1-249-417-11	CARBON	1K	5%	1/4W	
R890	1-249-421-11	CARBON	2.2K	5%	1/4W	
R891	1-249-429-11	CARBON	10K	5%	1/4W	
R893	1-247-893-11	CARBON	390K	5%	1/4W	

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Ref. No.	Part No.	Description	Remark
*	A-6727-384-A	YC-110 BOARD, COMPLETE	

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(Ref.No 6,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description				Remark
C001	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C002	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	
C003	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C004	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C005	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C006	1-124-126-00	ELECT	47uF	20%	10V	
C007	1-124-907-11	ELECT	10uF	20%	50V	
C008	1-124-902-00	ELECT	0.47uF	20%	50V	
C009	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C010	1-124-907-11	ELECT	10uF	20%	50V	
C011	1-124-257-00	ELECT	2.2uF	20%	50V	
C012	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C013	1-126-157-11	ELECT	10uF	20%	16V	
C014	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C015	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C017	1-164-157-11	CERAMIC CHIP	0.068uF	10%	25V	
C018	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C019	1-163-139-00	CERAMIC CHIP	820PF	5%	50V	
C020	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C021	1-163-097-00	CERAMIC CHIP	15PF	5%	50V	
C022	1-126-529-11	ELECT	0.47uF	20%	50V	
C023	1-126-233-11	ELECT	22uF	20%	50V	
C024	1-163-103-00	CERAMIC CHIP	27PF	5%	50V	
C025	1-124-767-00	ELECT	2.2uF	20%	50V	
C026	1-124-257-00	ELECT	2.2uF	20%	50V	
C027	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C028	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C029	1-163-111-00	CERAMIC CHIP	56PF	5%	50V	
C030	1-163-093-00	CERAMIC CHIP	10PF	5%	50V	
C031	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C032	1-124-126-00	ELECT	47uF	20%	10V	
C033	1-124-443-00	ELECT	100uF	20%	10V	
C034	1-126-233-11	ELECT	22uF	20%	50V	
C035	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	
C036	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C037	1-163-115-00	CERAMIC CHIP	82PF	5%	50V	
C038	1-163-109-00	CERAMIC CHIP	47PF	5%	50V	
C040	1-124-477-11	ELECT	47uF	20%	25V	
C041	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C042	1-126-301-11	ELECT	1uF	20%	50V	
C043	1-163-102-00	CERAMIC CHIP	24PF	5%	50V	
C045	1-163-115-00	CERAMIC CHIP	82PF	5%	50V	
C046	1-163-102-00	CERAMIC CHIP	24PF	5%	50V	
C047	1-163-031-11	CERAMIC CHIP	0.01uF		50V	

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Ref. No.	Part No.	Description			Remark
C048	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C049	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C050	1-124-927-11	ELECT	4.7uF	20%	100V
C051	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C052	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C054	1-124-126-00	ELECT	47uF	20%	10V
C055	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C056	1-163-116-00	CERAMIC CHIP	91PF	5%	50V
C058	1-163-108-00	CERAMIC CHIP	43PF	5%	50V
C059	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C060	1-124-903-11	ELECT	1uF	20%	50V
C061	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C062	1-124-903-11	ELECT	1uF	20%	50V
C063	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C064	1-126-301-11	ELECT	1uF	20%	50V
C065	1-124-257-00	ELECT	2.2uF	20%	50V
C066	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C067	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C068	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C069	1-126-176-11	ELECT	220uF	20%	10V
C070	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C071	1-124-477-11	ELECT	47uF	20%	25V
C072	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C074	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C075	1-126-163-11	ELECT	4.7uF	20%	50V
C076	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C077	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C078	1-124-126-00	ELECT	47uF	20%	10V
C079	1-124-126-00	ELECT	47uF	20%	10V
C080	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C081	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C082	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C083	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C084	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C085	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C086	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C087	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C088	1-126-154-11	ELECT	47uF	20%	6.3V
C090	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C091	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C092	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C093	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C094	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C096	1-126-233-11	ELECT	22uF	20%	50V
C097	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C099	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C100	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C101	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C202	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C203	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C204	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C206	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C207	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C208	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C209	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C210	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C211	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C212	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C213	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C214	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C215	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C216	1-124-443-00	ELECT	100uF	20%	10V
C217	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C218	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C219	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C220	1-124-463-00	ELECT	0.1uF	20%	50V
C222	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C224	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C226	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C227	1-130-477-00	MYLAR	0.0033uF	5%	50V
C228	1-163-097-00	CERAMIC CHIP	15PF	5%	50V

< FILTER >

Ref. No.	Part No.	Description
CF001	1-527-943-00	FILTER, CERAMIC

< CONNECTOR >

Ref. No.	Part No.	Description
* CN001	1-563-258-11	SOCKET, CONNECTOR 15P
* CN002	1-563-258-11	SOCKET, CONNECTOR 15P

< DIODE >

Ref. No.	Part No.	Description
D002	8-719-400-18	DIODE MA152WK
D003	8-719-400-18	DIODE MA152WK
D004	8-719-104-34	DIODE 1S2836
D006	8-719-400-18	DIODE MA152WK
D007	8-719-200-82	DIODE 11ES2
D008	8-719-400-18	DIODE MA152WK
D009	8-719-400-18	DIODE MA152WK
D010	8-719-400-18	DIODE MA152WK
D201	8-719-400-18	DIODE MA152WK
D202	8-719-400-18	DIODE MA152WK
D203	8-719-400-18	DIODE MA152WK

< DELAY LINE >

Ref. No.	Part No.	Description
DL001	1-415-728-11	DELAY LINE, 2H (ULTRASONIC)
DL201	1-415-856-11	DELAY LINE, ULTRASONIC GLASS

< FILTER >

Ref. No.	Part No.	Description	Remark
FL001	1-236-756-11	FILTER, LOW PASS	
FL002	1-236-755-11	FILTER, BAND PASS	

< IC >

Ref. No.	Part No.	Description	Remark
IC001	8-759-821-84	IC LA7340S	
IC002	8-759-822-29	IC LA7332	
IC003	8-759-996-63	IC BA7025L	
IC004	8-759-821-51	IC LC8992	
IC005	8-759-938-15	IC BA178M05	
IC201	8-759-637-11	IC M52063SP	

< JUMPER >

Ref. No.	Part No.	Description	Remark
JR101	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR102	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR103	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR104	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR105	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR106	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR201	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR205	1-216-295-00	METAL CHIP 0 5% 1/10W	

< COIL >

Ref. No.	Part No.	Description	Remark
L001	1-410-524-41	INDUCTOR 180uH	
L002	1-410-667-31	INDUCTOR 22uH	
L003	1-410-517-11	INDUCTOR 47uH	
L004	1-408-424-00	INDUCTOR 180uH	
L005	1-410-335-11	INDUCTOR 150uH	
L006	1-408-421-00	INDUCTOR 100uH	
L007	1-410-519-11	INDUCTOR 68uH	
L006	1-408-421-00	INDUCTOR 100uH	
L007	1-410-519-11	INDUCTOR 68uH	
L008	1-410-519-11	INDUCTOR 68uH	
L010	1-408-403-00	INDUCTOR 3.3uH	
L011	1-408-412-00	INDUCTOR 18uH	
L012	1-408-411-00	INDUCTOR 15uH	
L013	1-408-421-00	INDUCTOR 100uH	
L014	1-408-417-00	INDUCTOR 47uH	
L015	1-408-427-00	INDUCTOR 330uH	
L016	1-408-425-00	INDUCTOR 220uH	
L201	1-408-411-00	INDUCTOR 15uH	
L202	1-408-421-00	INDUCTOR 100uH	
L203	1-410-517-11	INDUCTOR 47uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-100-66	TRANSISTOR 2SC1623	
Q002	8-729-901-47	TRANSISTOR DTA143EK	
Q003	8-729-901-06	TRANSISTOR DTA144EK	
Q004	8-729-901-01	TRANSISTOR DTC144EK	
Q006	8-729-216-22	TRANSISTOR 2SA1162-G	
Q007	8-729-216-22	TRANSISTOR 2SA1162-G	
Q008	8-729-100-66	TRANSISTOR 2SC1623	
Q009	8-729-100-66	TRANSISTOR 2SC1623	
Q010	8-729-216-22	TRANSISTOR 2SA1162-G	
Q012	8-729-216-22	TRANSISTOR 2SA1162-G	
Q013	8-729-216-22	TRANSISTOR 2SA1162-G	
Q015	8-729-901-06	TRANSISTOR DTA144EK	
Q017	8-729-901-06	TRANSISTOR DTA144EK	
Q019	8-729-901-01	TRANSISTOR DTC144EK	
Q021	8-729-901-03	TRANSISTOR DTC144WK	
Q022	8-729-100-66	TRANSISTOR 2SC1623	
Q023	8-729-100-66	TRANSISTOR 2SC1623	
Q024	8-729-901-06	TRANSISTOR DTA144EK	
Q025	8-729-216-22	TRANSISTOR 2SA1162-G	
Q026	8-729-100-66	TRANSISTOR 2SC1623	
Q027	8-729-100-66	TRANSISTOR 2SC1623	
Q028	8-729-901-01	TRANSISTOR DTC144EK	
Q029	8-729-216-22	TRANSISTOR 2SA1162-G	
Q030	8-729-100-66	TRANSISTOR 2SC1623	
Q031	8-729-901-01	TRANSISTOR DTC144EK	
Q032	8-729-901-01	TRANSISTOR DTC144EK	
Q033	8-729-100-66	TRANSISTOR 2SC1623	
Q034	8-729-901-01	TRANSISTOR DTC144EK	
Q035	8-729-901-06	TRANSISTOR DTA144EK	
Q201	8-729-100-66	TRANSISTOR 2SC1623	
Q202	8-729-100-66	TRANSISTOR 2SC1623	
Q204	8-729-901-06	TRANSISTOR DTA144EK	
Q205	8-729-901-01	TRANSISTOR DTC144EK	
Q206	8-729-901-01	TRANSISTOR DTC144EK	
Q208	8-729-901-03	TRANSISTOR DTC144WK	
Q209	8-729-100-66	TRANSISTOR 2SC1623	
Q210	8-729-100-66	TRANSISTOR 2SC1623	
Q213	8-729-100-66	TRANSISTOR 2SC1623	
Q214	8-729-901-01	TRANSISTOR DTC144EK	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R001	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R002	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R003	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R004	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R005	1-216-025-00	METAL CHIP 100 5% 1/10W	
R006	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R007	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R008	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R009	1-216-025-00	METAL CHIP 100 5% 1/10W	
R010	1-216-084-00	METAL CHIP 30K 5% 1/10W	
R011	1-216-075-00	METAL CHIP 12K 5% 1/10W	

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Ref. No.	Part No.	Description				Remark
R012	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R014	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R016	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R017	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R018	1-216-043-00	METAL CHIP	560	5%	1/10W	
R020	1-216-052-00	METAL CHIP	1.3K	5%	1/10W	
R021	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R022	1-216-036-00	METAL CHIP	300	5%	1/10W	
R023	1-216-068-00	METAL CHIP	6.2K	5%	1/10W	
R024	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R025	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R026	1-216-041-00	METAL CHIP	470	5%	1/10W	
R027	1-216-041-00	METAL CHIP	470	5%	1/10W	
R028	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R029	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R030	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R031	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R032	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R034	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R035	1-216-045-00	METAL CHIP	680	5%	1/10W	
R036	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R037	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R038	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R039	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R040	1-216-748-11	METAL CHIP	39K	1%	1/10W	
R041	1-216-039-00	METAL CHIP	390	5%	1/10W	
R042	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R043	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R044	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R045	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R047	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R048	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R049	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R050	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R051	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R052	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R053	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R057	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R058	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R059	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R061	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R062	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R064	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R065	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R067	1-216-035-00	METAL CHIP	270	5%	1/10W	
R068	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R069	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R070	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R071	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R072	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R073	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R074	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R075	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R076	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R077	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R078	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R079	1-216-043-00	METAL CHIP	560	5%	1/10W	
R080	1-216-043-00	METAL CHIP	560	5%	1/10W	
R081	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R082	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R083	1-216-043-00	METAL CHIP	560	5%	1/10W	
R084	1-216-039-00	METAL CHIP	390	5%	1/10W	
R085	1-216-035-00	METAL CHIP	270	5%	1/10W	
R086	1-216-041-00	METAL CHIP	470	5%	1/10W	
R087	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R088	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R089	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R090	1-216-043-00	METAL CHIP	560	5%	1/10W	
R092	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R093	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R094	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R095	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R096	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R097	1-216-047-00	METAL CHIP	820	5%	1/10W	
R098	1-216-034-00	METAL CHIP	240	5%	1/10W	
R099	1-216-045-00	METAL CHIP	680	5%	1/10W	
R101	1-216-039-00	METAL CHIP	390	5%	1/10W	
R201	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R202	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R203	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R204	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R205	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R206	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R207	1-216-025-00	METAL CHIP	100	5%	1/10W	
R209	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R210	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R211	1-216-748-11	METAL CHIP	39K	1%	1/10W	
R212	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R213	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R214	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R215	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R216	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R217	1-216-047-00	METAL CHIP	820	5%	1/10W	
R218	1-216-047-00	METAL CHIP	820	5%	1/10W	
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R220	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R221	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R222	1-216-045-00	METAL CHIP	680	5%	1/10W	

Ref. No.	Part No.	Description			Remark
R223	1-216-045-00	METAL CHIP	680	5%	1/10W
R224	1-216-081-00	METAL CHIP	22K	5%	1/10W
R225	1-216-085-00	METAL CHIP	33K	5%	1/10W
R226	1-216-079-00	METAL CHIP	18K	5%	1/10W
R227	1-216-081-00	METAL CHIP	22K	5%	1/10W
R228	1-216-073-00	METAL CHIP	10K	5%	1/10W
R233	1-216-035-00	METAL CHIP	270	5%	1/10W
R234	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R235	1-216-037-00	METAL CHIP	330	5%	1/10W
R236	1-216-049-00	METAL CHIP	1K	5%	1/10W
R239	1-216-085-00	METAL CHIP	33K	5%	1/10W
R240	1-216-091-00	METAL CHIP	56K	5%	1/10W
R241	1-216-105-00	METAL CHIP	220K	5%	1/10W
R242	1-216-089-00	METAL CHIP	47K	5%	1/10W
R243	1-216-077-00	METAL CHIP	15K	5%	1/10W
R244	1-216-049-00	METAL CHIP	1K	5%	1/10W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV002	1-241-630-11	RES, ADJ, CARBON 10K (SYNC. AGC)
RV003	1-241-630-11	RES, ADJ, CARBON 10K (DEV. SET)
RV004	1-241-629-11	RES, ADJ, CARBON 4.7K (CAR. SET)
RV005	1-241-629-11	RES, ADJ, CARBON 4.7K (PB LEVEL)
RV006	1-241-627-11	RES, ADJ, CARBON 1K (CCD LEVEL)
RV007	1-241-626-21	RES, ADJ, CARBON 470 (SECAM DET)
RV008	1-241-627-11	RES, ADJ, CARBON 1K (REC. C)
RV201	1-241-630-11	RES, ADJ, CARBON 10K (AFC SET)

< COIL >

Ref. No.	Part No.	Description
T001	1-409-467-11	COIL (TRAP 7.8K)

< VIBRATOR >

Ref. No.	Part No.	Description
X001	1-578-688-11	VIBRATOR, CRYSTAL (4.433619MHz)

* * *

MISCELLANEOUS

Ref. No.	Part No.	Description	Remark
2	1-466-601-61	SWITCH BLOCK, CONTROL (X55ME)	
2	1-466-601-71	SWITCH BLOCK, CONTROL (X55DH)	
2	1-466-601-81	SWITCH BLOCK, CONTROL (383)	
17	1-692-062-21	SWITCH, ROTARY	
23	1-465-864-21	REMOTE COMMANDER (RMT-V109A)	
⚠63	1-413-671-12	POWER BLOCK	
103	X-3727-784-1	MOTOR ASSY (LOADING) (M904)	
105	1-506-482-11	CONNECTOR 3P, MALE	
210	1-543-647-11	HEAD, FE	
214	8-848-537-11	DRUM ASSY DZH-21A-R (M901)	
234	8-848-540-01	UPPER DRUM ASSY (DZR-21-R)	
256	1-571-920-11	SWITCH, ROTARY	
264	8-729-926-31	PHOTO TRANSISTOR PT483F1S (Q001, Q002)	
265	8-719-985-00	DIODE GL451VS1 (LED) (D001)	
278	X-3733-302-1	MOTOR ASSY, CAM (M903)	
286	8-835-394-11	MOTOR, DC U-26F (CAPSTAN) (M902)	
DW001	1-809-495-11	SENSER, DEW CONDENSATION	

* * *

ACCESSORIES & PACKING MATERIALS

	Part No.	Description
	1-465-864-21	REMOTE COMMANDER (RMT-V109A)
	1-551-513-00	CORD, CONNECTION (PAL) (X55DH/X55DH)
	1-569-008-11	ADAPTER, CONVERSION 2P (X55ME)
⚠	1-575-131-11	CORD, POWER
	3-695-308-01	DRIVER, TUNING
	3-701-630-00	BAG, POLYETHYLENE
	3-753-793-41	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (X55ME)
	3-753-793-51	MANUAL, INSTRUCTION (ENGLISH, CHINESE) (X55DH)
	3-753-793-61	MANUAL, INSTRUCTION (ENGLISH) (383)
*	3-945-098-01	CUSHION (UPPER)
*	3-945-101-01	CUSHION (LOWER)
*	3-945-102-01	INDIVIDUAL CARTON (X55ME)
*	3-946-085-11	INDIVIDUAL CARTON (X55DH)
*	3-946-085-21	INDIVIDUAL CARTON (383)

* * *

HARDWARE LIST

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
#3	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3
#4	7-682-645-01	SCREW +PS 3X4
#5	7-624-102-04	STOP RING 1.5, TYPE -E
#6	7-628-254-00	SCREW +PS 2.6X5
#7	7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT
#8	7-682-548-04	SCREW +P 3X8
#9	7-621-255-15	SCREW +P 2X3
#10	7-682-547-04	SCREW +P 3X6

* * *

The components identified by
mark ⚠ or dotted line with mark
⚠ are critical for safety.
Replace only with part number
specified.

SECTION 7
MECHANICAL ADJUSTMENTS

Refer to "VHS MECHANICAL ADJUSTMENT MANUAL Ⅱ"separately issued for MECHANICAL ADJUSTMENTS.

PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand.(Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is doen.

CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that has been dipped cleaning fluid.

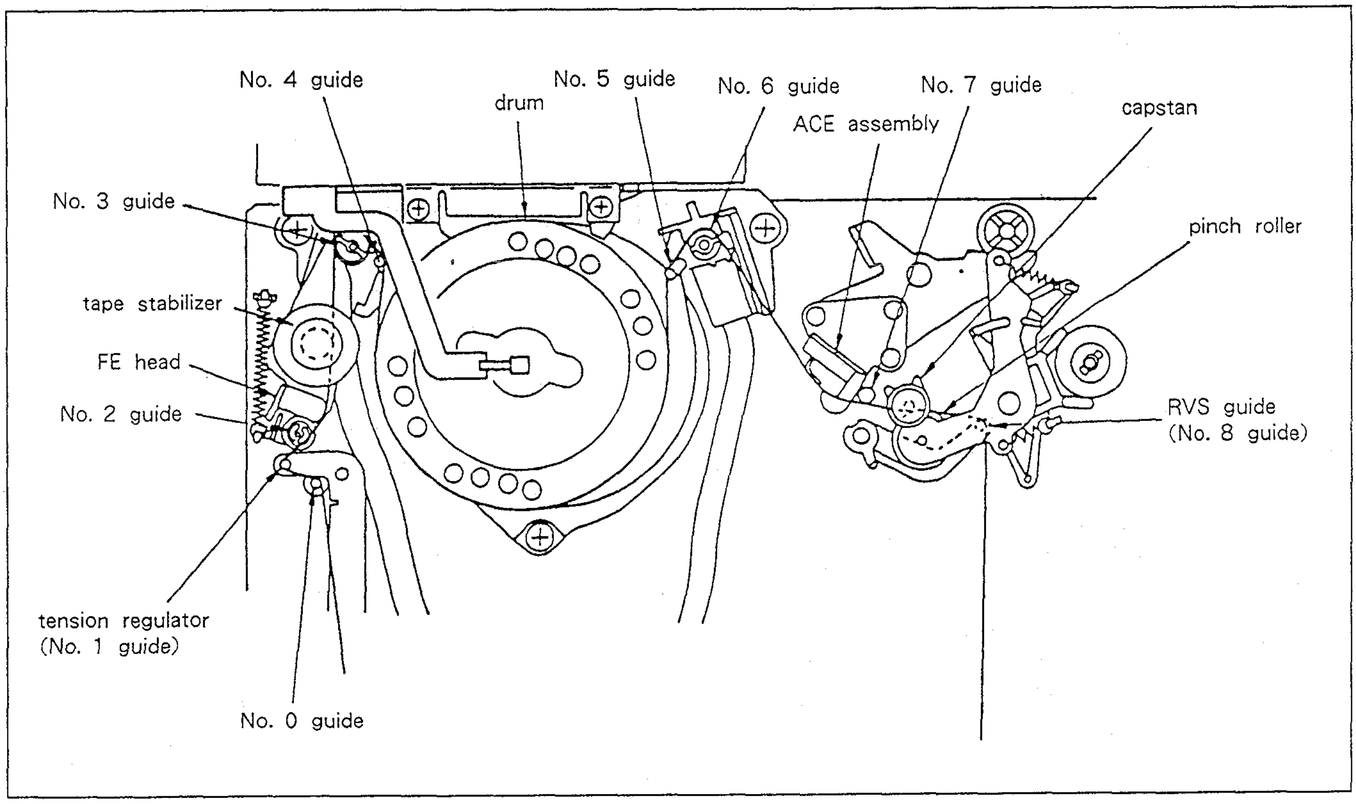

No. 4 guide
No. 5 guide
drum
No. 6 guide
No. 7 guide
ACE assembly
capstan
No. 3 guide
pinch roller
tape stabilizer
FE head
No. 2 guide
RVS guide
(No. 8 guide)
tension regulator
(No. 1 guide)
No. 0 guide

Fig. 1 Parts requiring cleaning

PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

	Maintenance & Check	Replacement Part No.	Operating Hours (H)										Remarks
			500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Tape Transportation System	Cleaning of tape transportation system		○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	A-6761-135-A	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y		○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Timing belt	3-736-013-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to “VHS MECHANICAL ADJUSTMENT MANUAL Ⅱ” item 4-1-1. Specified value : adjust to 24 to 34g • cm (when measured with torque cassette tape)
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70–120g • cm

○ Cleaning ☆ Confirmation

Note : On overhaul
When overhauling the unit, replace parts as indicated in the above table.

SECTION 8
ELECTRICAL ADJUSTMENTS

During the Adjustment, See the Parts Arrangement Diagram for the Adjustments on Page 128.

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

[Using Instruments]

1) Color TV
2) Oscilloscope 1 or 2 phenomera, band 30MHz min, delay mode, as provided.
3) Frequency counter (min. 8 digits)
4) PAL pattern generator
   SECAM pattern generator
   NTSC pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion factor meter
10) Alignment tape
    Part Code : PAL : H7099052H (MH-2)
    SECAM : H7099053H

[Connection]

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

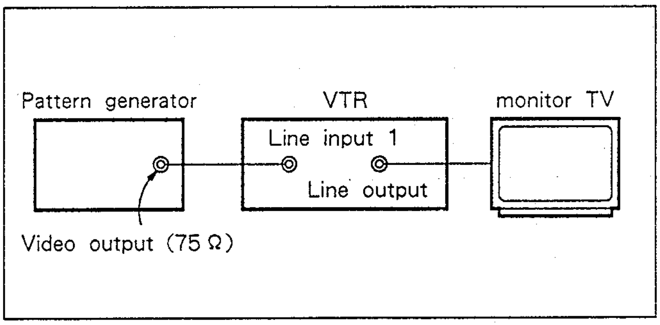

Pattern generator
VTR
monitor TV
Line input 1
Line output
Video output (75 Ω)

Fig. 8-1.

[Set-Up Adjustment]

Video signals output by a pattern generator are used as adjustment signals when marking the electrical adjustments, and these video output signals should be within the required standard. Connect an oscilloscope with LINE 1 input signal terminal. Check that the amplitudes of video SYNC signals, picture portions, and burst signals are flat at approximately 0.3, 0.7, and 0.3V, respectively, and the level ratio of the burst signal and "red" signal is 0.30 : 0.66 (PAL). Fig. 8-2. shows video signals (color bars) used in marking the electrical adjustment.

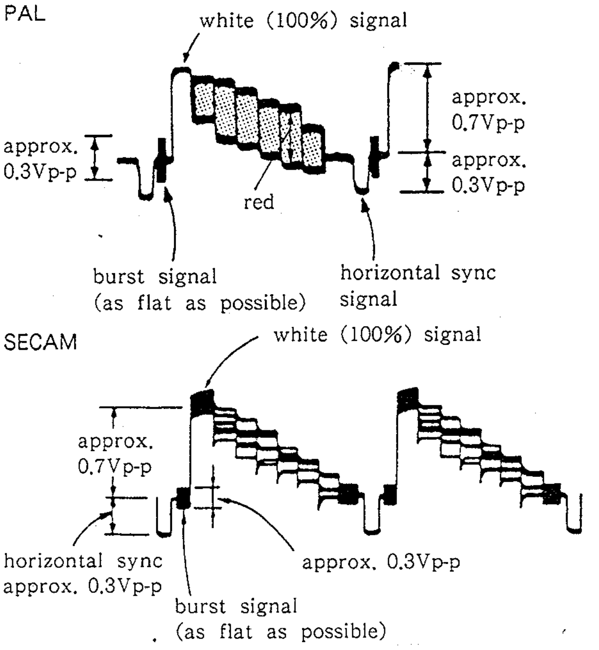

PAL
white (100%) signal
approx. 0.7Vp-p
approx. 0.3Vp-p
approx. 0.3Vp-p
red
burst signal (as flat as possible)
horizontal sync signal
SECAM
white (100%) signal
approx. 0.7Vp-p
horizontal sync approx. 0.3Vp-p
approx. 0.3Vp-p
burst signal (as flat as possible)

Fig. 8-2.

[PAL Alignment Tape (HM-2)]

	Mode	Time	Video signal	Audio signal
1	SP	10minutes	Stair-step	6kHz
2		5minutes	–	3kHz
3		10minutes	Color bar	1kHz
4		3minutes	RF sweep	–

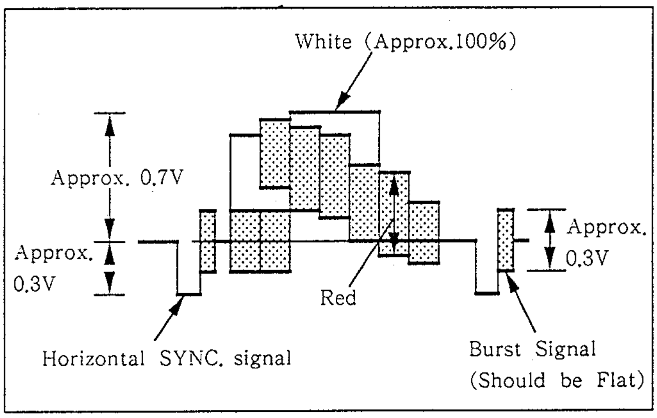

White (Approx.100%)
Approx. 0.7V
Approx. 0.3V
Approx. 0.3V
Red
Horizontal SYNC. signal
Burst Signal (Should be Flat)

Fig. 8-3.

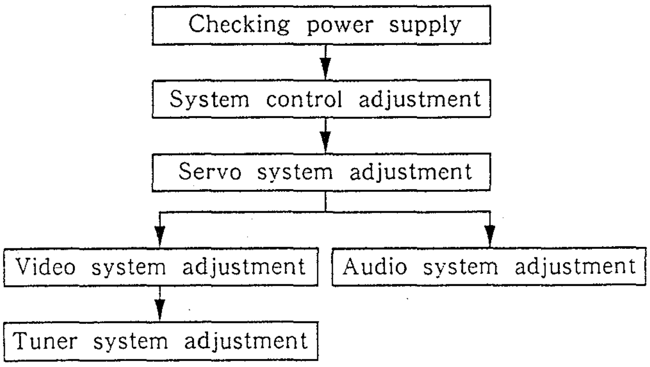
[Standard input/output level and impedance]

Input/output terminal

Video inputs	LINE IN 1 and 2 : phono jacks 1Vp-p, 75ohms, unbalanced, sync negative
Audio inputs	LINE IN 1 and 2 : phono jacks −7.5dBs (0dBs=0.775Vrms), more than 47kilohms
Video outputs	LINE OUT : phono jack 1Vp-p, 75ohms, unbalanced, sync negative
Audio outputs	LINE OUT : phono jack −7.5dBs at load impedance 47kilohms Output impedance : less than 10kilohms

[Adjusting Sequence]

Make the electrical adjustment in the following sequence.


Checking power supply
System control adjustment
Servo system adjustment
Video system adjustment
Audio system adjustment
Tuner system adjustment

8-1. POWER SUPPLY CHECK (POWER SUPPLY BOARD)

Mode	E-E
Measurement equipment	Digital voltmeter
SWD 12V check	
Measurement point	CN711 pin ② and ③
Specified value	$12.3^{+0.3}_{-0.4}$ Vdc
UNSWD 12V check	
Measurement point	CN711 pin ⑥
Specified value	12.0±0.3Vdc
SWD 5V check	
Measurement point	CN711 pin ⑨
Specified value	$5.1^{+0.15}_{-0.1}$ Vdc
SWD 9V check	
Measurement point	CN711 pin ⑦
Specified value	9.0±0.3Vdc
UNSWD 5.8V check	
Measurement point	CN711 pin ⑧
Specified value	5.9±0.25Vdc
UNSWD 43V check	
Measurement point	CN711 pin ⑮
Specified value	43±4.0Vdc
UNSWD −30V check	
Measurement point	CN711 pin ⑱
Specified value	−27.5±2.5Vdc
UNSWD 3.6V check	
Measurement point	Between CN711 pin ⑯ and pin ⑰
Specified value	$3.6^{+0.2}_{-0.6}$ Vdc

[Checking Method]

1) Confirm that each voltage satisfies its specified value.

POWER SUPPLY BOARD (conductor side)

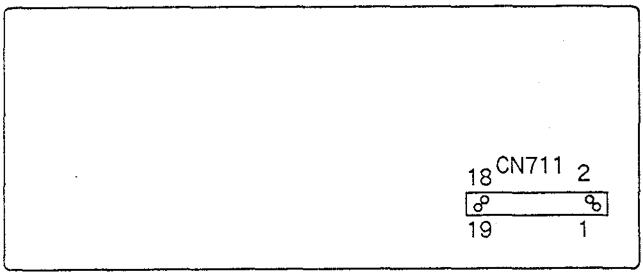

18 CN711 2
19 1

Fig. 8-4.

8-2. SYSTEM CONTROL ADJUSTMENT

8-2-1. Clock Oscillation Frequency Check (AO-24 Board)

Mode	E-E
Signal	None
Measurement point	IC601 pin ㉘
Measurement equipment	Frequency counter
Specified value	17.734470MHz±100Hz

Note : Connect a 10kΩ resistor to the frequency counter.

[**Checking Method**]

1) Confirm that the frequency at the IC601 pin ㉘ is 17.734470MHz±100Hz.

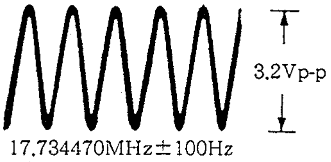


Fig. 8-5.

8-2-2. OSD Adjustment (AO-24 Board)

Mode	E-E
Signal	Color bar (PAL)
Measurement point	IC602 pin ⑧
Measurement equipment	Frequency counter
Adjustment element	RV651
Specified value	15.625kHz±100Hz

Note 1 : Connect the frequency counter to IC602 pin ⑧ through oscilloscope.

Note 2 : Pull up IC602 pin ① to +5V with a 1kΩ resistor.

[**Adjustment Method**]

1) Adjust RV651 so that the reading on the frequency counter becomes within 15.625kHz±100Hz.

8-3. SERVO SYSTEM ADJUSTMENT

8-3-1. Switching Position Adjustment (MA-130 Board)

Mode	PB
Signal	Alignment tape SP stair-step
Measurement point	CH1 : CN105 pin ⑧ (VIDEO) CH2 : CN105 pin ⑥ (RF SWP)
Measurement equipment	Oscilloscope
Adjustment element	RV501
Specified value	6.5±0.5H (410±30 μsec)

[**Adjustment Method**]

1) Press the tracking adjustmemt buttons ▲and▼at the same time so that the tracking cndition is the center portion.
   (AUTO TRACKING indicator is turns off)
2) Adjust to 6.5±0.5H (410±30 μsec) with RV501.

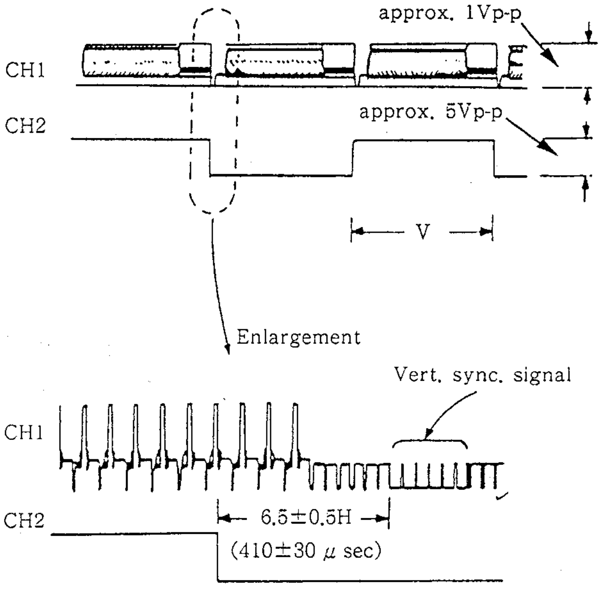


Fig. 8-6.

8-4. VIDEO SYSTEM ADJUSTMENT

Adjust the video system in the following sequence as a rule. The color video signal supplied from the pattern generator is used as a video input signal for video system adjustment in the recording mode.
Make sure that sync. and color burst signals meet requirements specified at set up of adjustment shown in Fig. 8-1.

[Adjustment Sequence]
8-4-1. X'tal Oscillation Frequency Check
8-4-2. Sync. AGC Adjustment
8-4-3. CCD Level Adjustment
8-4-4. Playback Y Signal Level Adjustment
8-4-5. Sync. Tip Carrier Set and Deviation Adjustment
8-4-6. White Clip, Dark Clip Check
8-4-7. Recording Y Signal Level Check
8-4-8. Recording Chroma Level Adjustment
8-4-9. AFC Adjustment
8-4-10. SECAM Detection Adjustment

8-4-1. X'tal Oscillation Frequency Check (YC-110 Board)

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	IC002 pin ⑰
Measurement equipment	Frequency counter, Oscilloscope
Specified value	8.867238MHz±135Hz

Note : Connect the frequency counter through a probe of high input impedance (about 10MΩ) and low capacity (10pF or less).

[Checking Method]
1) Confirm that the frequency of IC002 ⑰ is 8.867238MHz±135Hz.
2) At the same time confirm that the level is 250±150mVp-p.

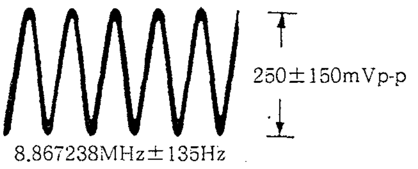


Fig. 8-7.

8-4-2. Sync. AGC Adjustment (YC-110 Board)

Mode	E-E
Signal	Color bar (PAL)
Measurement point	VIDEO OUT terminal
Measurement equipment	Oscilloscope
Adjustment element	RV002
Specified value	1.00±0.05Vp-p

[Adjustment Method]
1) Adjust to 1.00±0.05Vp-p with RV002.

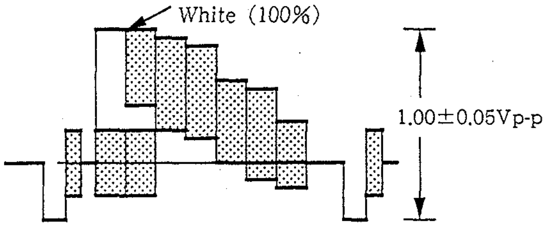


Fig. 8-8.

8-4-3. CCD Level Adjustment (YC-110 Board)

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	CH1 : IC001 pin ⑩ CH2 : IC001 pin ⑨ (Inverted)
Measurement equipment	Oscilloscope (Add mode)
Adjustment element	RV006
Specified value	Minimum (within 30mVp-p)

[Adjustment Method]
1) Adjust the level to the minimum (within 30mVp-p) with RV006.

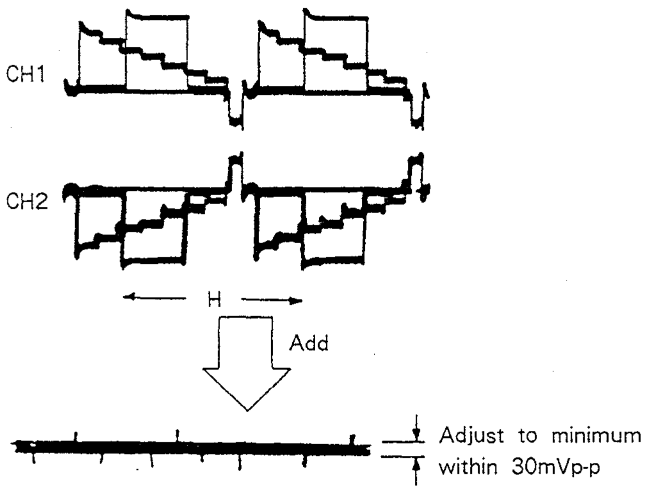


Fig. 8-9.

8-4-4. Playback Y Signal Level Adjustment (YC-110 Board)

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	VIDEO OUT terminal
Measurement equipment	Oscilloscope
Adjustment element	RV005
Specified value	1.00±0.05Vp-p

Note : Make this adjustment with the RENTAL PICTURE switch turned off.

[Adjustment Method]

1) Adjust to 1.00±0.05Vp-p with RV005.

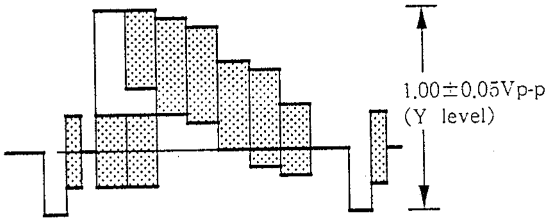


Fig. 8-10.

8-4-5. Sync. Tip Carrier Set and Deviation Adjustment (YC-110 Board)

Sync chip carrier set	
Mode	E-E
Signal	None (Note 2)
Measurement point	IC001 pin ㉚
Measurement equipment	Frequency counter
Adjustment element	RV004
Specified value	3.80±0.05MHz
Deviation adjustment	
Mode	REC and PB
Signal	Color bar (PAL)
Measurement point	VIDEO OUT terminal
Measurement equipment	Oscilloscope
Adjustment element	RV003
Specified value	1.00±0.05Vp-p

Note 1 : Video output terminal must be terminated at 75 Ω.

Note 2 : To make no signal input, insert a shorting plug into a video input terminal.

[Adjustment Method]

1) Input the color bar signal to place the system in the E-E mode.
2) Make a no-signal state and select the E-E mode. (Note 2)
3) Connect the frequency counter to the IC001 pin ㉚ and adjust to 3.80±0.05MHz with RV004.
4) Input the color bar signal to make recording.
5) Play back a recorded tape portion and check the playback Y signal level of VIDEO OUT terminal. Specified value : 1.00±0.05Vp-p.
6) When the specified value is not met, input the color bar signal to select the E-E mode. Adjust RV003 to correct a playback Y signal level, and then, repeat the steps 2 through 5 above.

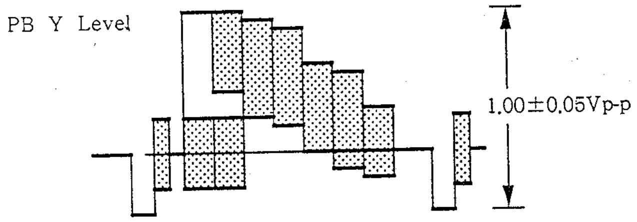


Fig. 8-11.

8-4-6. White Clip, Dark Clip Check (YC-110 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC001 pin ②
Measurement equipment	Oscilloscope
Specified value	White clip : 165−190% Dark clip : 40±10%

[Checking Method]

1) Check that white and dark clip level meet the specified values, when the heigh from sync to white level is 100%.

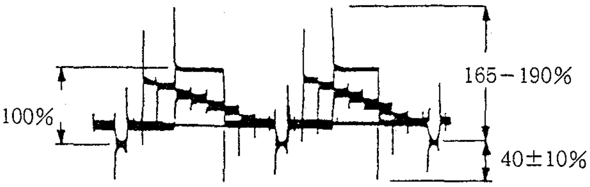


Fig. 8-12.

8-4-7. Recording Y Signal Level Check (YC-110 Board)

Mode	E-E
Signal	None
Measurement point	CN001 pin ①
Measurement equipment	Oscilloscope
Specified valuc	380±50mVp-p

[Checking Method]

1) Confirm that the amplitude level on oscilloscope is within 380±50mVp-p.

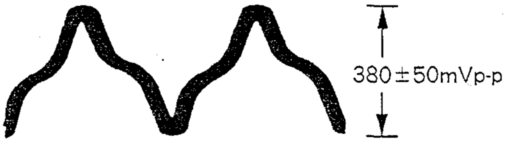


Fig. 8-13.

8-4-8. Recording Chroma Level Adjustment (YC-110 Board)

Mode	E-E
Signal	Color bar (PAL)
Measurement point	CN002 pin ⑧
Measurement equipment	Oscilloscope
Adjustment element	RV008
Specified value	120±10mVp-p

[Adjustment Method]

1) Adjust to the specified value with RV008.

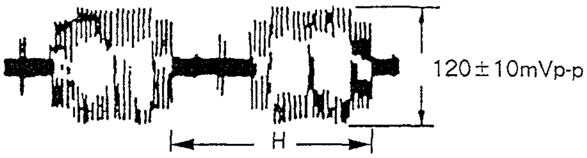


Fig. 8-14.

8-4-9. AFC Adjustment (YC-110 Board)

Mode	E-E
Signal	Color bar (NTSC)
Measurement point	IC201 pin ⑦
Measurement equipment	Frequency counter
Adjustment element	RV201
Specified value	15,734±10Hz

Note : To make the AFC free run mode, IC201 pin ⑱ must be pulled up to 5V

[Adjustment Method]

1) Adjust to the specified value with RV201.

8-4-10. SECAM Detection Adjustment (YC-110 Board)

Mode	E-E
Signal	Color bar (SECAM)
Measurement point	IC003 pin ⑪
Measurement equipment	Oscilloscope
Adjustment element	RV007
Specified value	4.4±0.1Vp-p

[Adjustment Method]

1) Adjust with RV007 so that the waveform on IC003 pin ⑪ becomes to the specified value.

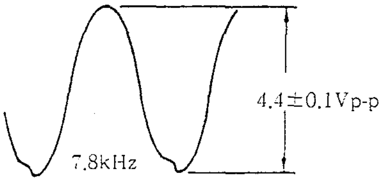


Fig. 8-15.

8-5. AUDIO SYSTEM ADJUSTMENT

- Adjust the audio system in the SP mode, unless otherwise specified.
  Use the alignment tape.

[Connection]

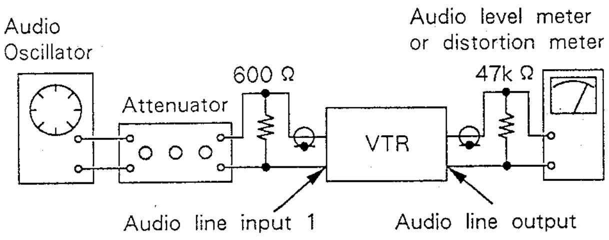


Fig. 8-16.

8-5-1. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified.
  Use a normal VHS cassette for an adjustment tape.
- Make adjustment with the switches set to the following positions :
  INPUT SELECT ····· LINE 1

[Adjustment Sequence]

1. ACE Head Adjustment··· See "VHS MECHANICAL ADJUSTMENT MANUAL II".
2. E-E Output Level Check
3. Recording Bias Adjustment
4. Overall Level Characteristic and Distortion Factor Check
5. Overall S/N Check

1. ACE Head Adjustment
   See "VHS MECHANICAL ADJUSTMENT MANUAL II"

2. E-E Output Level Check (AO-24 Board)

Mode	E-E
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	−7.5±2dBs

[Confirmation Method]

1) Input a signal of 400Hz, −7.5dBs to Audio Line Input.
2) Confirm that the audio output level is −7.5±2dBs.

3. Recording Bias Adjustment (AO-24 Board)

Mode	REC and PB
Signal	400Hz, −27.5dBs 7kHz, −27.5dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Adjustment element	RV901
Specified value	0±1dB

[Adjustment Method]

1) Supply a signal of 400Hz, −27.5dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate −27.5dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400Hz and 7kHz.
7) Confirm that the 7kHz playback output level is within a range of 0±1dB to the 400Hz playback output level.
   When it is out of this range, adjust RV901 and repeat the step 1) through 7) above.

4. Overall Level Characteristic and Distortion Factor Check

Mode	REC and PB
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level : −7.5±2dBs Distortion factor : 4% or less

[Confirmation Method]

1) Supply an audio signal of 400Hz, −7.5dBs Audio Line Input.
2) Make recording.
3) Playback a recorded portion.
4) Confirm that a playback level is −7.5±2dBs.
5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

Mode	REC and PB
Signal	400Hz, −7.5dBs, and no signal
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	38dB or more

[Confirmation Method]

1) Supply a signal of 400Hz to Audio Line Input. Adjust the attenuator so that the audio line output level will be −7.5dBs.
2) Make recording.
3) With the REC mode held, make the no-signal state. (Short an input).
4) Playback a recorded portion, and confirm that there is a level difference of 38dB or more between 400Hz portion and no-signal portion (immediately after a 400Hz signal).

8-6. TUNER SYSTEM ADJUSTMENT

8-6-1. RF AGC Adjustment (TU701 Unit/MA-130 Board)

Mode	E-E
Signal	Broadcasting TV signal
Adjustment element	VR of TU701 unit (Fig. 8-17.)

[Adjustment method]

1) Adjust monitor TV to its maximum contrast and receive broadcasting TV signal.
2) Turn the VR so that snow noise becomes appear.
3) Turn the VR inverse direction and set it at a position where snow noise disappears.
4) Receive each channel and confirm that there are no beat, picture distortion and snow noise due to inter modulation.

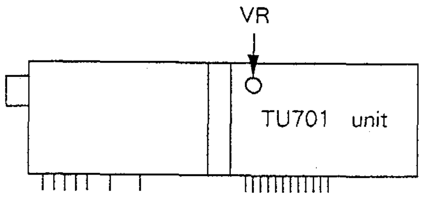
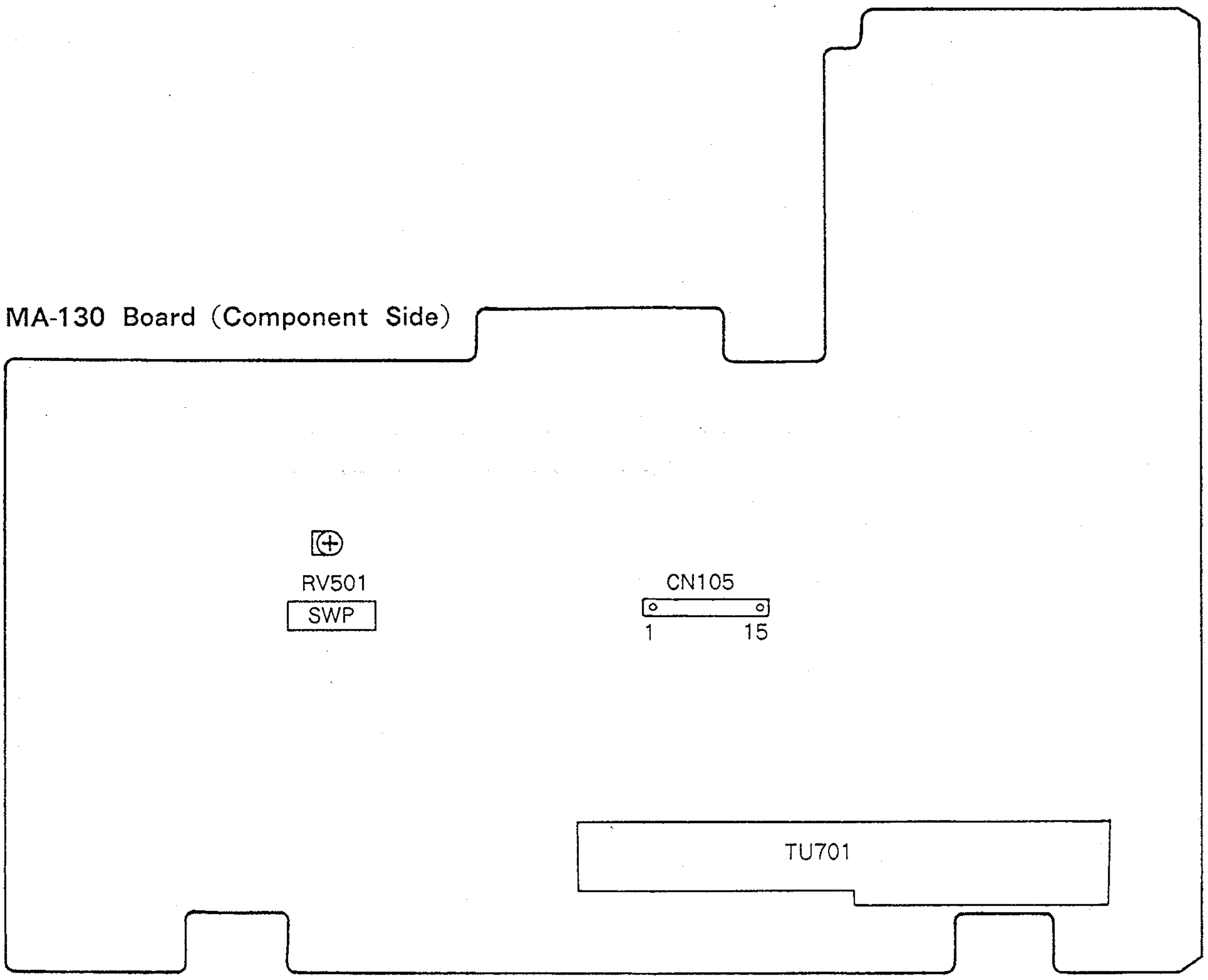


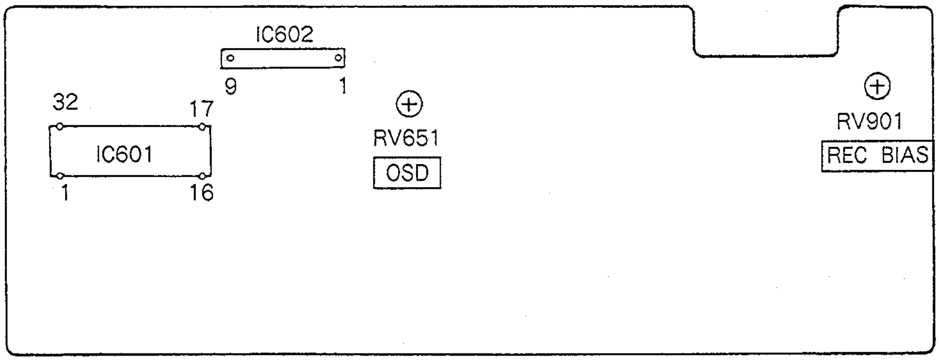
Fig. 8-17.

8-7. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

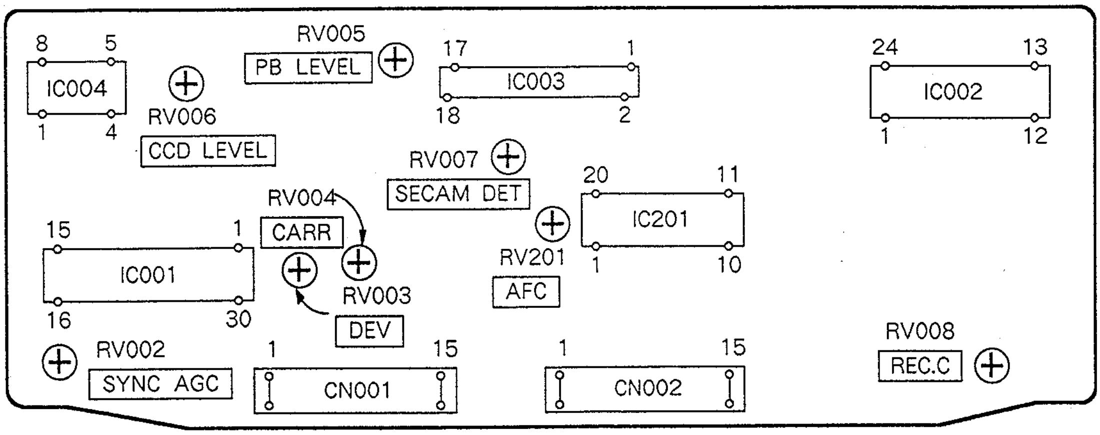
MA-130 Board (Component Side)


RV501
SWP
CN105
1
15
TU701

AO-24 Board (Component Side)


IC602
9
1
32
17
IC601
1
16
RV651
OSD
RV901
REC BIAS

YC-110 Board (Conductor Side)


8
5
IC004
1
4
RV006
CCD LEVEL
RV005
PB LEVEL
17
1
IC003
18
2
24
13
IC002
1
12
RV007
SECAM DET
20
11
IC201
1
10
RV201
AFC
RV004
CARR
RV003
DEV
15
1
IC001
16
30
RV002
SYNC AGC
1
15
CN001
1
15
CN002
RV008
REC.C

9-973-161-11

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Home Video Group

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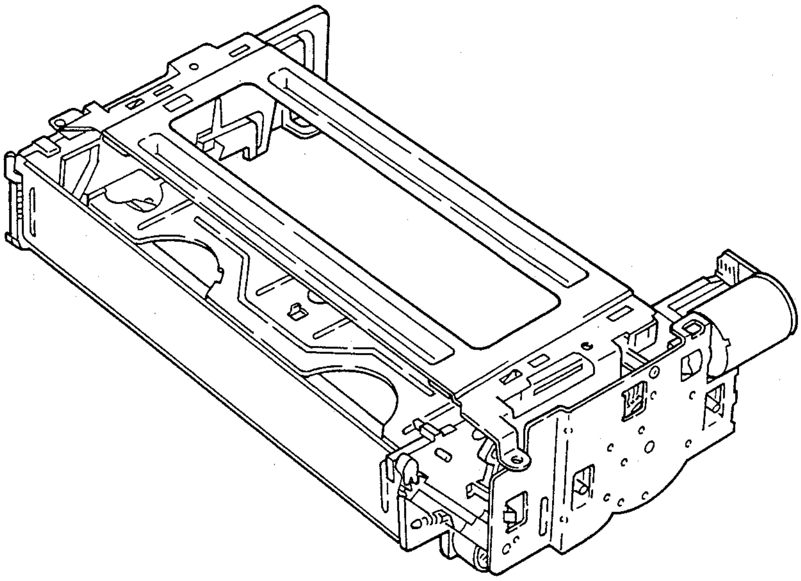
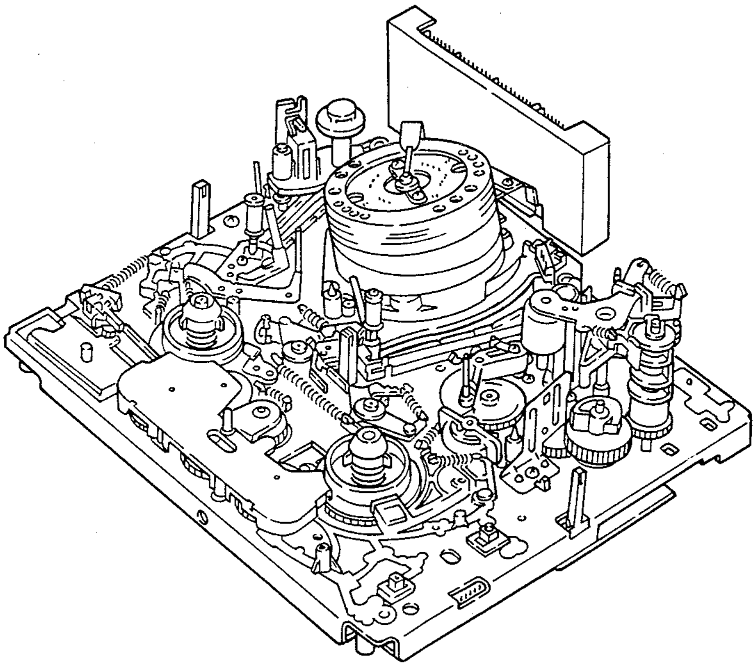
VHS MECHANICAL ADJUSTMENT MANUAL Ⅱ

- Please use in conjunction with the SERVICE MANUAL.
- This VHS MECHANICAL ADJUSTMENT MANUAL Ⅱ can be used for NTSC system and PAL system.





VHS VIDEO RECORDER

SONY®

MICROFILM

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1. PREPARATIONS FOR CHECKS, ADJUSTMENTS AND REPLACEMENT OF THE DECK MECHANISM

Note : Refer to "Replacement Method" in the Service Guide for instructions on replacing the cabinet and PC boards. DO not perform cassette loading or threading with the VCR positioned upside-down.

1-1. LOADING AND UNLOADING VIDEO CASSETTES WITH THE POWER OFF. (Fig. 1-1.)

1-1-1. Manual loading and unloading

1) Rotate the loading motor in the direction of arrow Ⓐ until loading is compleated.
(When unloading, rotate the loading motor in the direction of arrowⒷ.)

1-1-2. Loading and unloading using a separate power source.

1) Cassette loading is performed by applying approx. 10V (300 mA) to the power terminal of the loading motor using a stabilized DC power source.
(When unloading, apply the same voltage to the opposite polarity of the power terminal.)

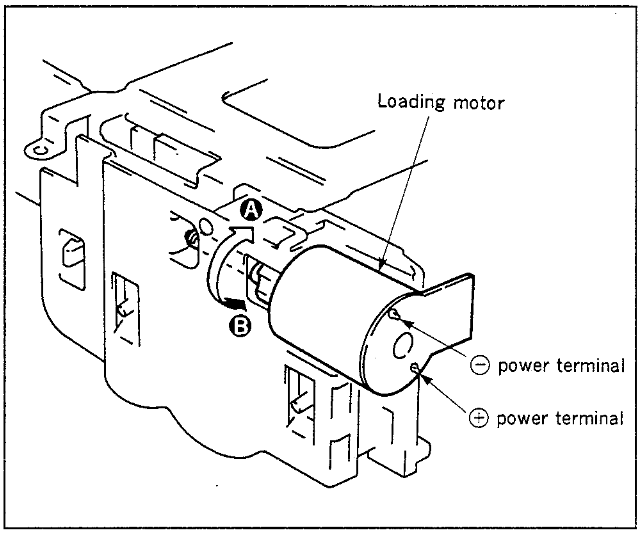


Fig. 1-1.

1-2. THREADING AND UNTHREADING WITH THE POWER OFF. (Fig. 1-2)

1-2-1. Manual threading and unthreading

1) Rotate the cam motor ❶ in the direction of arrowⒶuntil threading is completed.
(When unthreading, rotate the cam motor ❶ in the direction of arrowⒷ.)

1-2-2. Threading and unthreading using a separate power source.

1) Threading is performed by applying approx. 10V (500 mA) to the power terminal for the cam motor ❶ using a DC stabilized power source.
(When unthreading, apply the same voltage to the opposite polarity of the power terminal.)

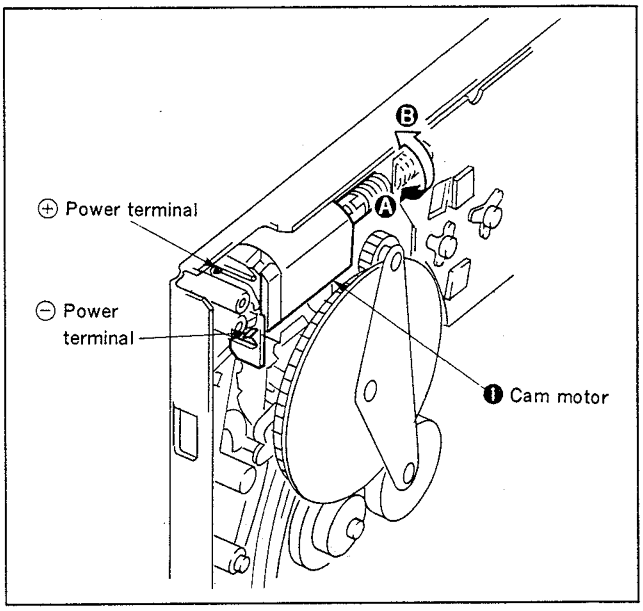


Fig. 1-2.

1-3. TO COMPLETE THREADING WITH THE FL CASSETTE CONTROLLER REMOVED. (Fig. 1-3)

1) Unplug the AC power cord from the power outlet.
2) Shield the supply, take-up sensors and the LED with black-masking tape.
3) Hold the cassatte down switch depressed by taping it, etc.
4) Plug the AC power cord into a power outlet.
   (At this time, the power should turn on and the tape rewinds for approx. 10 seconds, and the power turns off.)
5) Turn the power switch ON so that the mechanism is ready for loading.

Note : In this condition, the VTR is ready to operate in the different operating modes, including the record mode. At this time, rewind the tape for at least 15 seconds, then perform fast forward (FF).

Note : Following the above, be sure to reset the mechanism to the previous state as outlined below.

1) Remove the black-masking tape shielding the supply and take-up sensors, the LED and the tape holding cassette down switch.
2) Unplug the AC power cord from the power outlet to reset the system control microprocessor.

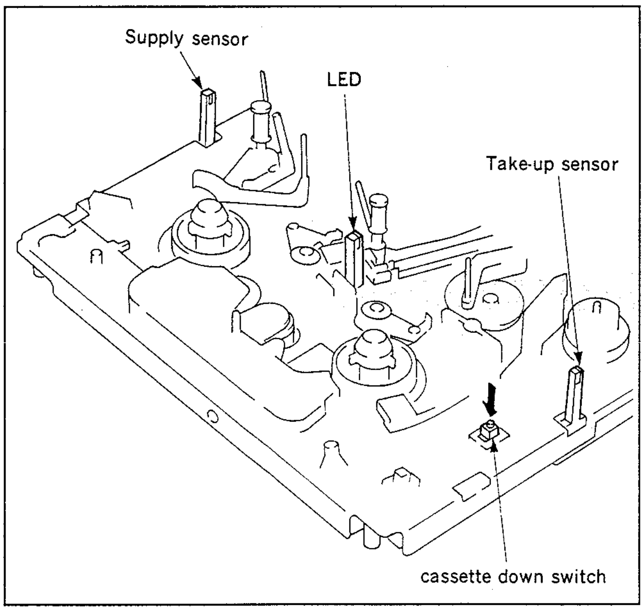


Fig. 1-3.

2. PERIODICAL INSPECTION AND REPLACEMENT

We recommend performing the following periodical inspections and maintenance in order to ensure that the unit operates in top condition and offers full performance, as well as realizes a long life of the mechanism and tapes.

* Be sure to perform the following maintenance procedures after the unit is repaired (regardless how long the unit has been used.)

2-1. CLEANING THE ROTARY HEAD DISC ASS'Y

1) Press Attach a deer skin cloth (Jig. Ref. No. J-7) soaked in cleaning solution (Jig. Ref. No. J-5) lightly to the rotary drum ass'y, then turn the rotary head disc slowly by hand to clean the surface of the rotary drum ass'y. (At this time, do not turn on the power motor to rotate the rotary head disc for cleaning.)
2) Also, do not wipe the drum ass'y by moving the deer skin cloth vertically across the head as this could damage of the tip of the head.

2-2. CLEANING THE TAPE TRANSPORT SYSTEM

1) Clean the tape transport surfaces (tape guide, a drum ass'y surfaces, capstan, pinch roller, etc.) with a deer skin cloth soaked in an approved in the recommended cleaning solution.

2-3. CLEANING THE DRIVE SYSTEM

1) Wipe the drive mechanism with an ordinary cloth soaked in an approved cleaning solution.

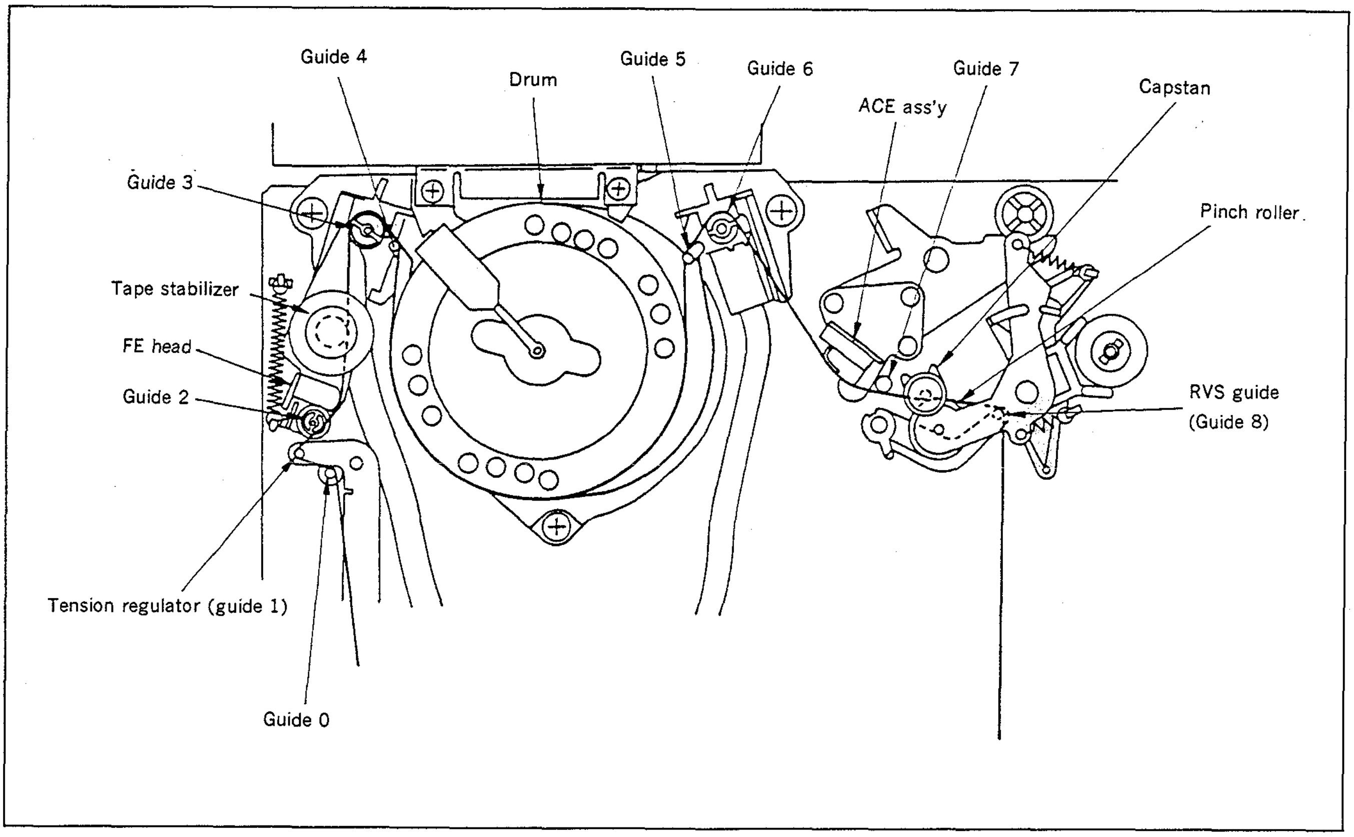

Guide 4
Drum
Guide 5
Guide 6
Guide 7
ACE ass'y
Capstan
Guide 3
Pinch roller.
Tape stabilizer
FE head
Guide 2
RVS guide
(Guide 8)
Tension regulator (guide 1)
Guide 0

Fig. 2-1.

2-4. PERIODIC MAINTENANCE

Location of Maintenance and Check		User Hours Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Perfor mance Check	Clean tape running surfaces	——	○	○	○	○	○	○	○	○	○	○	Always perform after repair.
	Clean, degauss ACE ass'y	——	○	○	○	○	○	○	○	○	○	○	
	Clean, degauss video disc ass'y	——	○	○	○	○	○	○	○	○	○	○	Head life is greatly affected by environment and method of use.
Driving System	Reel belt	3-736-013-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Always perform after repair.
Tape Running System	Abnormal noise	——	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace source of abnormal noise.
	Back tension measurement	——	–	☆	–	☆	–	☆	–	☆	–	☆	Check according to 4-1-1. Spec : 24 — 34g/cm (Measured with torque cassette)
	Brake system check	——	–	☆	–	☆	–	☆	–	☆	–	☆	
	REC/PB function check	——	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Always perform after repair.
	Forward torque measurement		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Spec : 80 — 140 g•cm

○ Cleaning ☆ Check

Note : Refer to the above items for part replacement when performing an overhaul.

2-5. SERVICE TOOLS AND JIGS

Ref. No.	Description	Part No.	Printing on jig	Remarks
J-1	Master plane	H-7099-279-H		
J-2	Reel disc height jig	H-7099-038-H		
J-3	Torque gauge adapter	H-7099-035-H		
J-4	Torque gauge	H-7099-039-H		
J-5	0.93mm Allen wrench	H-7099-202-H		
J-6	NTSC torque cassette VHT-063S PAL torque cassette	J-6082-011-A J-6082-066-A		For rewind torque and back tension
	NTSC torque cassette VHT-404S PAL torque cassette	J-6082-012-A J-6082-067-A		For cue/review
J-7	NTSC alignment tape JVC-MH-1 PAL alignment tape JVC-MH-2	H-7099-046-H H-7099-052-H		
	NTSC Hi-Fi alignment tape PAL Hi-Fi alignment tape	H-7099-153-H H-7099-175-H		
J-8	Cleaning fluid	Y-2031-001-0	———	
J-9	Chamois cloth	2-034-697-00	———	Cleaning
J-10	Head degausser	Widely available	———	Video, audio head degaussing
J-11	Small adjustment mirror (with handle) Small adjustment mirror (mirror only)	J-6080-029-A J-6080-030-1	SL-5052	For tape path and tape running adjustment and check

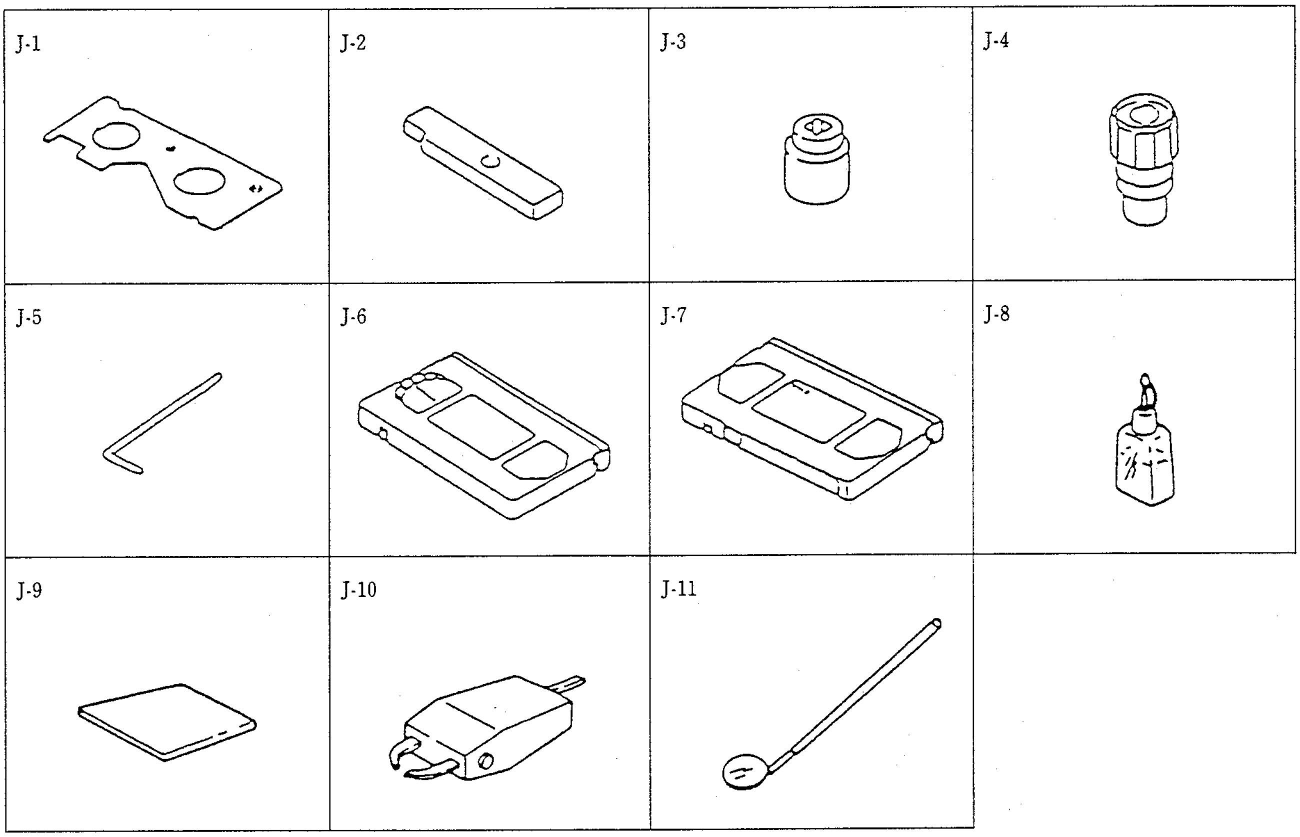


Fig. 2-2. Service tools and jigs

3. REPLACEMENT OF MAJOR COMPONENT PARTS OF THE DECK MECHANISM

Note :
- ○ Refer to "Replacement Method" in the Service Guide for replacing the cabinet and PC boards.
- ○ When mounting parts, reverse the replacement procedure while referring to "Precautions on Mounting Parts".
- ○ After grease coated parts such as gears are replaced, re-grease the replaced part.
- ○ Do not touch the guides (taped surface) and brake shoe directly with your fingers or grease them, etc.
- ○ Gears must be mounted so that they mesh with each other.

3-1. FL MECHANISM

3-1-1. FL door (Fig. 3-1.)

1) Press the claw ❶ in the direction of arrow Ⓐ, then remove the FL door ❷ in the direction of arrow Ⓑ.

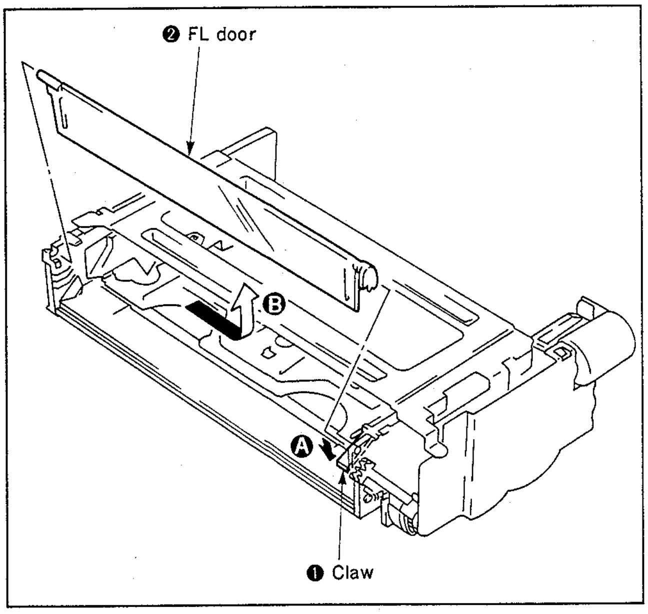

❷ FL door
Ⓑ
Ⓐ
❶ Claw

Fig. 3-1.

3-1-2. Erasure protection lever (Fig. 3-2)

1) Remove the spring ❶.
2) Disengage the claw ❷, then slide the erasure protection lever ❸ in the direction of arrow Ⓐ.
3) Disengage the erasure protection lever ❸ in the direction of arrow Ⓑ.

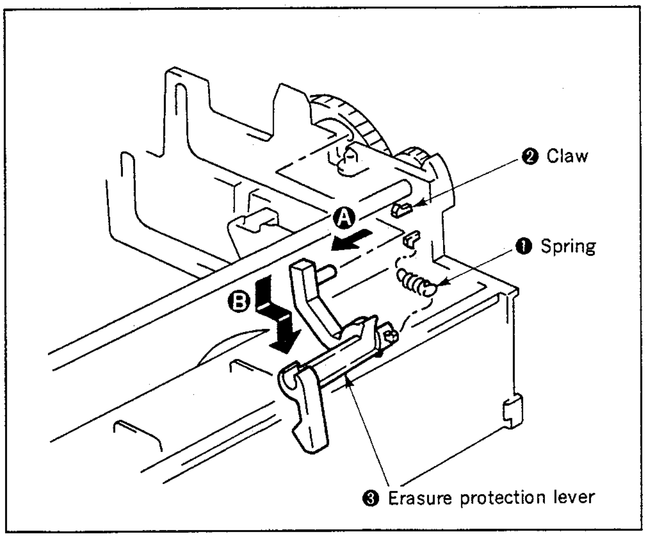

❷ Claw
Ⓐ
❶ Spring
Ⓑ
❸ Erasure protection lever

Fig. 3-2.

3-1-3. Gear cover ass'y (Fig. 3-3)

1) Disengage the four claws ❶, then remove the gear cover ass'y ❷.

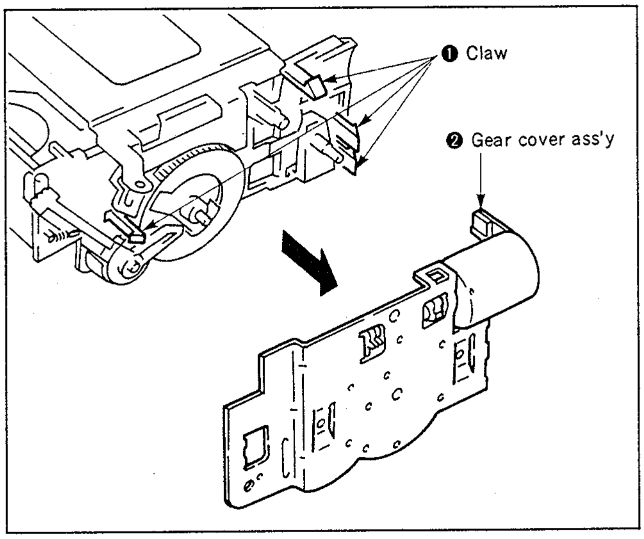

❶ Claw
❷ Gear cover ass'y

Fig. 3-3.

3-1-4. Loading motor, worm gear (FL), worm wheel (FL), worm bearing (Fig. 3-4)

1) Remove washer 3 ❶, then pull out the worm wheel (FL) ❷.
2) Remove the two screws ❸, then remove the loading motor ❹.
3) Remove the worm gear (FL) ❺ and worm bearing ❻.

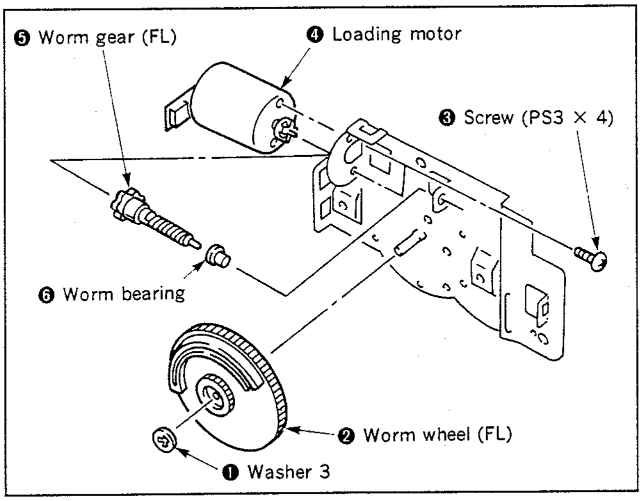

❺ Worm gear (FL)
❹ Loading motor
❸ Screw (PS3 × 4)
❻ Worm bearing
❷ Worm wheel (FL)
❶ Washer 3

Fig. 3-4.

3-1-5. Door OPEN/CLOSE arm (Fig. 3-5)

1) Remove the spring ❶.
2) Pull out the door OPEN/CLOSE arm ❷.

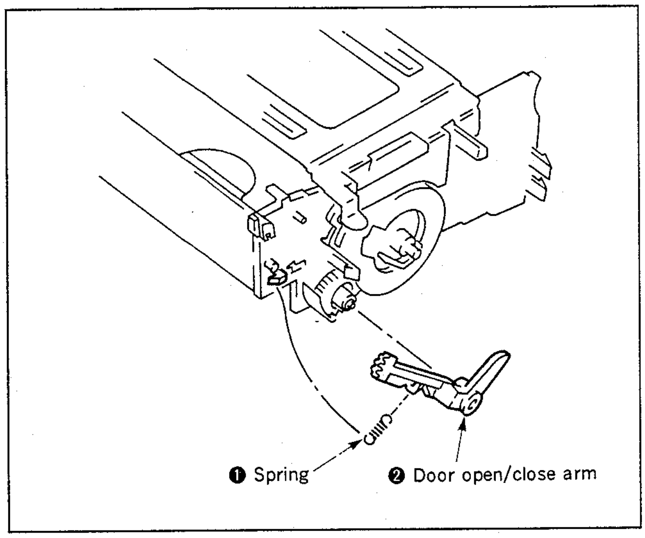

❶ Spring
❷ Door open/close arm

Fig. 3-5.

[Precautions on remounting] (Figs. 3-6 and 3-7.)

- ○ When mounting the gear cover ass'y, match up the two holes on the gear cover ass'y with the two holes on the worm wheel (FL) and then with the hole on the right drive arm ass'y.
- ○ Mesh the FL door and the door OPEN/CLOSE arm together as shown in Ⓐ section in the figure below.
- ○ The erasure protection lever shaft must fit into the groove on the left drive arm ass'y.

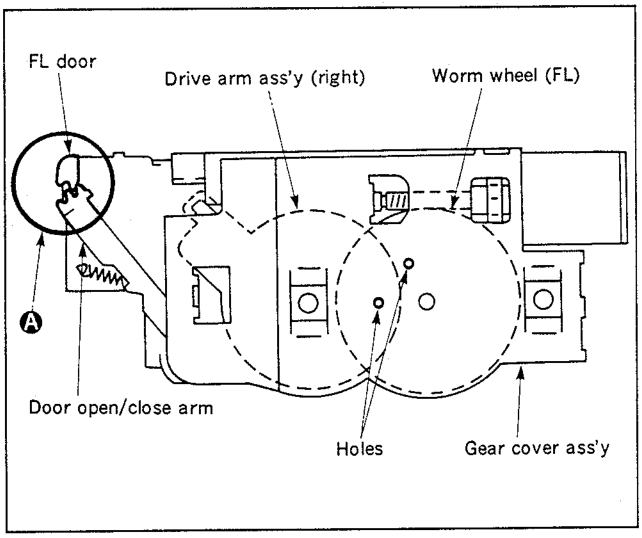

FL door
Drive arm ass'y (right)
Worm wheel (FL)
Ⓐ
Door open/close arm
Holes
Gear cover ass'y

Fig. 3-6.

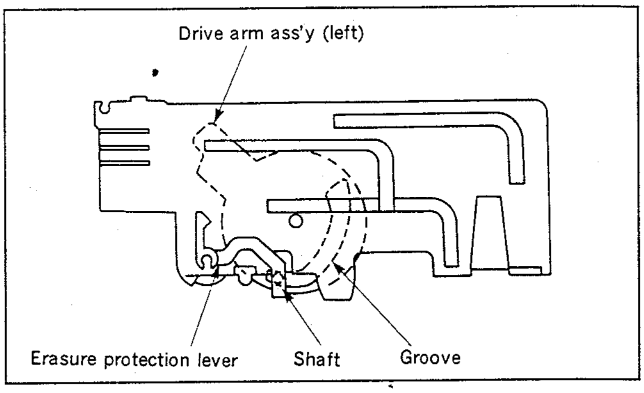

Drive arm ass'y (left)
Erasure protection lever
Shaft
Groove

Fig. 3-7.

3-2. TS ASS'Y AND GUIDE ROLLER ASS'Y No. 2 (Fig. 3-8)

1) Remove the spring ❶.
2) Remove the TS ass'y ❷ in the direction of arrow Ⓐ.
3) Turn guide roller ass'y No. 2 ❸ in the direction of arrow Ⓑ and pull it out.

[Precautions on remounting]

- ○ Clean the surface of guide roller No. 2 ❸ where the tape is attached.
- ○ Apply lubricant over the section shown in Figure A below.

[Adjustment after replacement]

- ○ Perform tape path adjustments as described in 4-1.

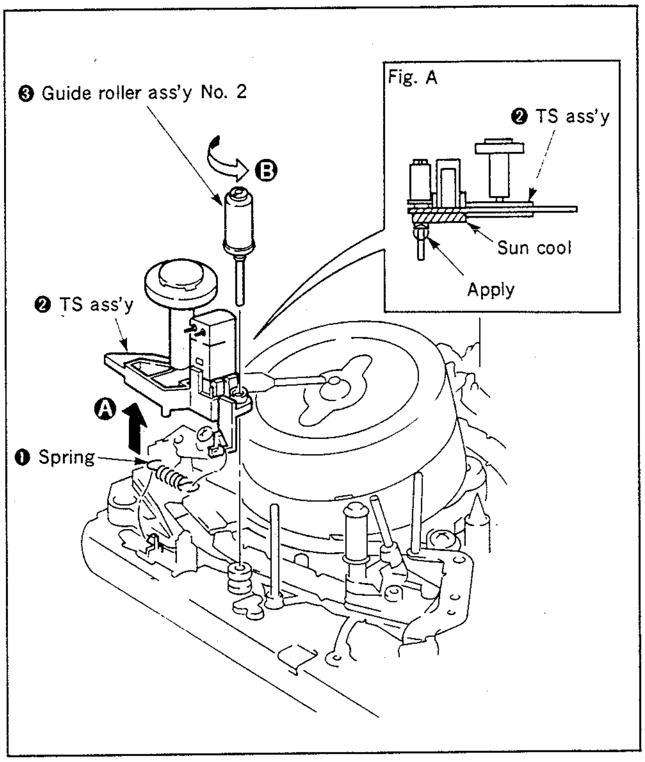

❸ Guide roller ass'y No. 2
Ⓑ
❷ TS ass'y
Ⓐ
❶ Spring
Fig. A
❷ TS ass'y
Sun cool
Apply

Fig. 3-8.

3-3. ACE ASS'Y (Fig. 3-9)

1) Slide the torsion coil spring ❶ in the direction of the arrow.
2) Remove the nylon nut N3 ❷, then pull out the ACE ass'y ❸.
3) Remove the ACE adjuster screw ❹.

[Precautions on remounting]

○ Clean the surface of the ACE ass'y ❸ where the tape is attached.

○ Hook both ends of the torsion coil spring ❶ to the ass'y as shown in Figure A below.

○ Adjust the ACE adjuster screw ❹ to the height shown in Figure A.

[Adjustment after replacement]

○ Perform tape path adjustments as described in 4-1.

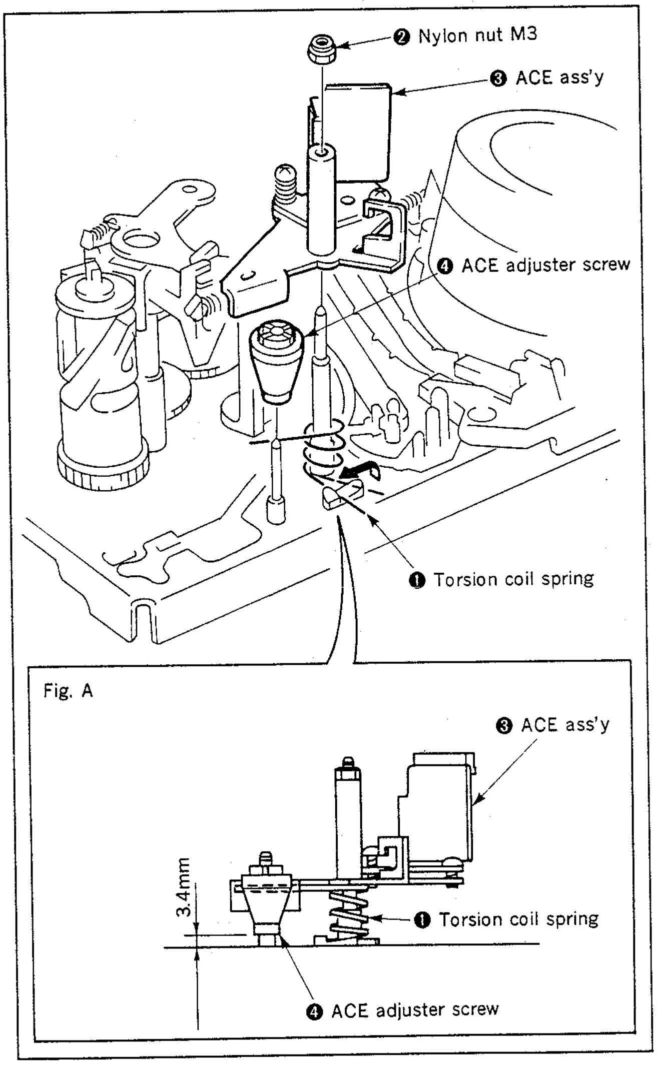

❷ Nylon nut M3
❸ ACE ass'y
❹ ACE adjuster screw
❶ Torsion coil spring
Fig. A
❸ ACE ass'y
3.4mm
❶ Torsion coil spring
❹ ACE adjuster screw

Fig. 3-9.

3-4. DRUM ASS'Y (Fig. 3-10)

1) Remove the three screws ❶, then remove the drum ass'y ❷.

[Precautions on remounting]

○ Do not touch the head tips ❸ and the ground plate ❹ directly with your fingers or tools.

○ Clean the surface of the drum ass'y ❷ where a tape is attached.

○ The stopper ❺ must be attached at the point shown in the figure below.

○ Screws must be fastened with a 6kg·cm (±1kg·cm) screw fastening torque. (The screws can be mounted in any order.)

[Adjustment after replacement]

○ Perform tape path adjustments as described in 4-1.

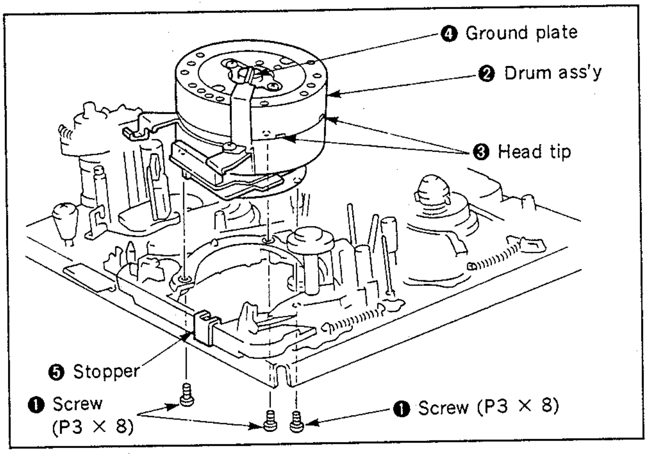

❹ Ground plate
❷ Drum ass'y
❸ Head tip
❺ Stopper
❶ Screw (P3 × 8)
❶ Screw (P3 × 8)

Fig. 3-10.

3-5. DRUM BASE ASS'Y (Fig. 3-11)

1) Remove the drum. (Refer to 3-4.)
2) Remove the three screws ❶, then remove the drum base ass'y ❷.

[Precautions on remounting]

○ The spacer ❸ for the drum base must be mounted in its previous position as shown in the figure below. [Note that some units do not feature the spacer ❸.]

○ Fastening torque must be 10kg·cm (±1kg·cm)

○ The screws must be mounted in order of (a),(b) and (c).

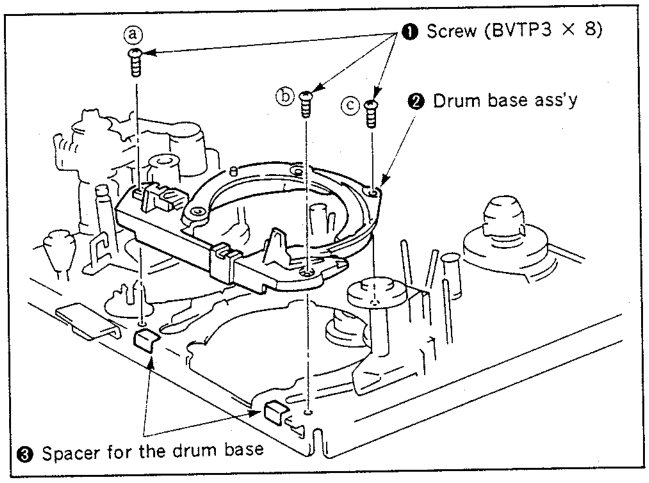

ⓐ
ⓑ
ⓒ
❶ Screw (BVTP3 × 8)
❷ Drum base ass'y
❸ Spacer for the drum base

Fig. 3-11.

3-6. PINCH ROLLER ASS'Y AND ELEVATOR CAM (Fig. 3-12)

1) Remove the two claws ❶, then pull out the stopper ❷.
2) Pull out the pinch roller ass'y ❸.
3) Pull out the elevator cam ❹.

[Precautions on remounting]

- ○ Clean the surface of the pinch roller ass'y ❸ where the tape is attached.
- ○ Match up the ▯ marks on the elevator cam ❹ and cam gear, press ❺.

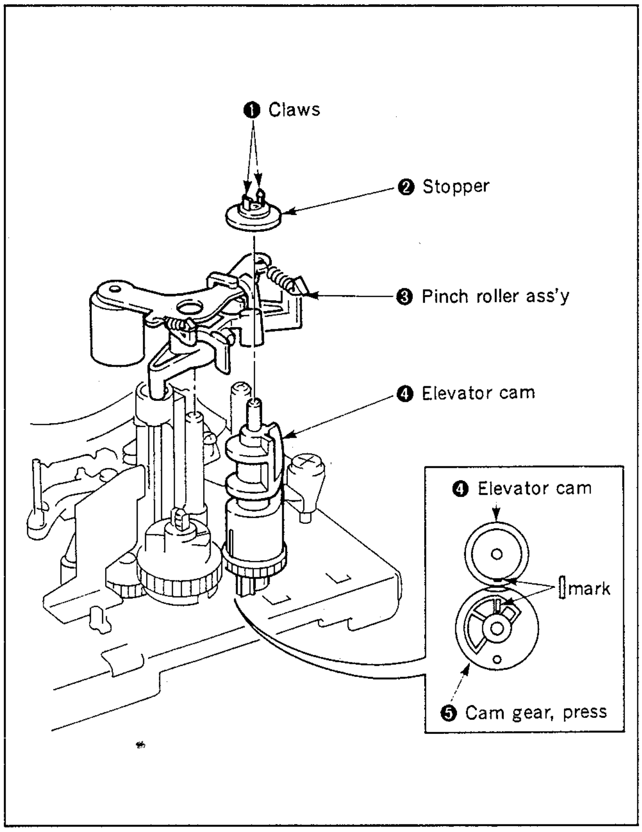

❶ Claws
❷ Stopper
❸ Pinch roller ass'y
❹ Elevator cam
❹ Elevator cam
▯mark
❺ Cam gear, press

Fig. 3-12.

3-7. CAM GEAR, PRESS AND TRANSMISSION GEAR (Fig. 3-13)

1) Remove the pinch roller ass'y. (Refer to 3-6.)
2) Remove the screw ❶, then remove the lid release plate ❷.
3) Remove the two claws ❸, then pull out the cam gear, press ❹.
4) Remove the washer 2 ❺, then pull out the transmission gear ❻.

[Precautions on remounting]

- ○ Check the top and bottom of the transmission gear ❻.
- ○ Match up the hole ❼ on the chassis with the hole ❼ on the cam gear, press ❹.
- ○ Match up the ▯ mark on the cam gear, press ❹ with the ▯ mark on the alleviator cam ❽.

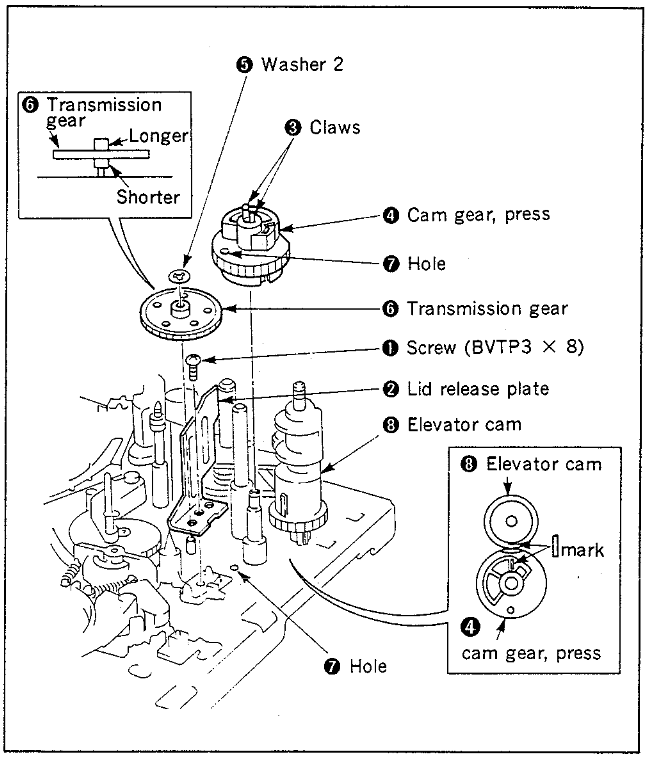

❺ Washer 2
❻ Transmission gear
Longer
Shorter
❸ Claws
❹ Cam gear, press
❼ Hole
❻ Transmission gear
❶ Screw (BVTP3 × 8)
❷ Lid release plate
❽ Elevator cam
❽ Elevator cam
▯mark
❹ cam gear, press
❼ Hole

Fig. 3-13.

3-8. RVS ARM ASS'Y AND RVS CAM GEAR (Fig. 3-14)

1) Remove the nylon nut M2 ❶ and plastic washer ❷.
2) Disengage the claw ❸, then pull out the RVS arm ass'y ❹.
3) Remove washer 2 ❺, then pull out the RVS cam gear ❻.

[Precautions on remounting]

- ○ The holes ❼ in the chassis and in the RVS cam gear ❻ must match up. Also, make sure to match up the holes ❾ on the cam gear, press ❽ and the chassis.
- ○ The spring ❿ must be hooked as shown in Fig. A below.
- ○ Clean the surface of the RVS arm ass'y ❹ where a tape is attached.
- ○ Apply 1/2 drop of lubricant to the shaft ⓫.

[Adjustment after replacement]

- ○ Perform tape path adjustments as described in 4-1.

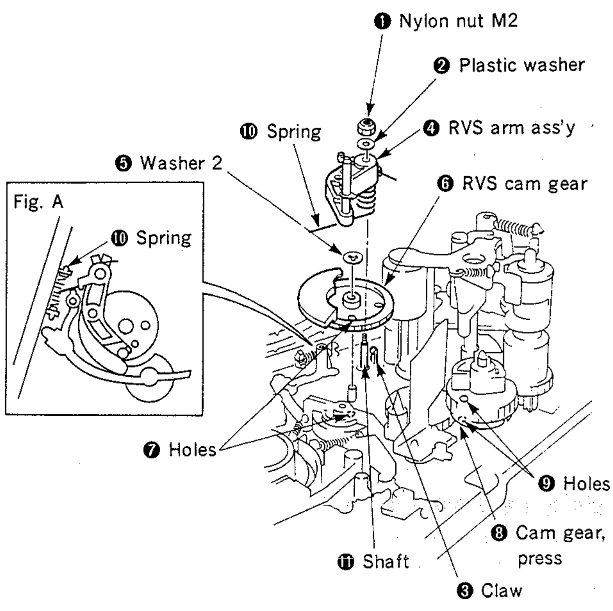

❶ Nylon nut M2
❷ Plastic washer
❿ Spring
❹ RVS arm ass'y
❺ Washer 2
❻ RVS cam gear
Fig. A
❿ Spring
❼ Holes
❾ Holes
❽ Cam gear, press
⓫ Shaft
❸ Claw

Fig. 3-14.

3-9. GUIDE No. 7 (Fig. 3-15)

1) Remove the nylon nut M3 ❶.
2) Pull out guide flange No. 7 ❷, guide sleeve No. 7 ❸, guide flange No. 7 ❹ and compression coil spring ❺ in the given order.

[Precautions on remounting]

- ○ Clean the surface of the guide sleeve No. 7 ❸ where the tape is attached.
- ○ Adjust the height of guide No. 7 to the height shown in Fig. A below.

[Adjustment after replacement]

- ○ Perform tape path adjustments as described in 4-1.

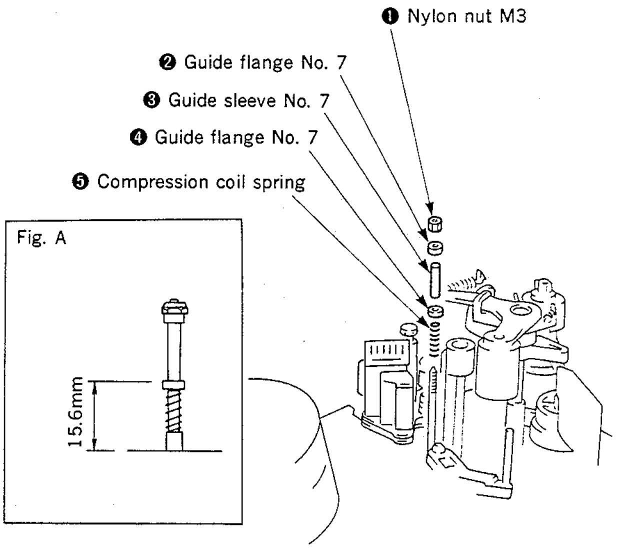

❶ Nylon nut M3
❷ Guide flange No. 7
❸ Guide sleeve No. 7
❹ Guide flange No. 7
❺ Compression coil spring
Fig. A
15.6mm

Fig. 3-15.

3-10. S-BRAKE ASS'Y, T-BRAKE ASS'Y (Fig. 3-16)

1) Remove the spring ❶.
2) Disengage the claw ❷, then pull out the S-brake ass'y ❸.
3) Disengage the claw ❹, then pull out the T-brake ass'y ❺.

[Precautions on remounting]

- ○ Do not touch the brake shoes for the respective S-brake ❸ and T-brake ❺ assy's directly with your fingers.
- ○ Do not hold on to the S-brake ❸ and T-brake ❺ assy's by the arms when inserting them.
- ○ The T-brake ass'y ❺ must be positioned above the S-brake ass'y ❸ as shown in Fig. A below.

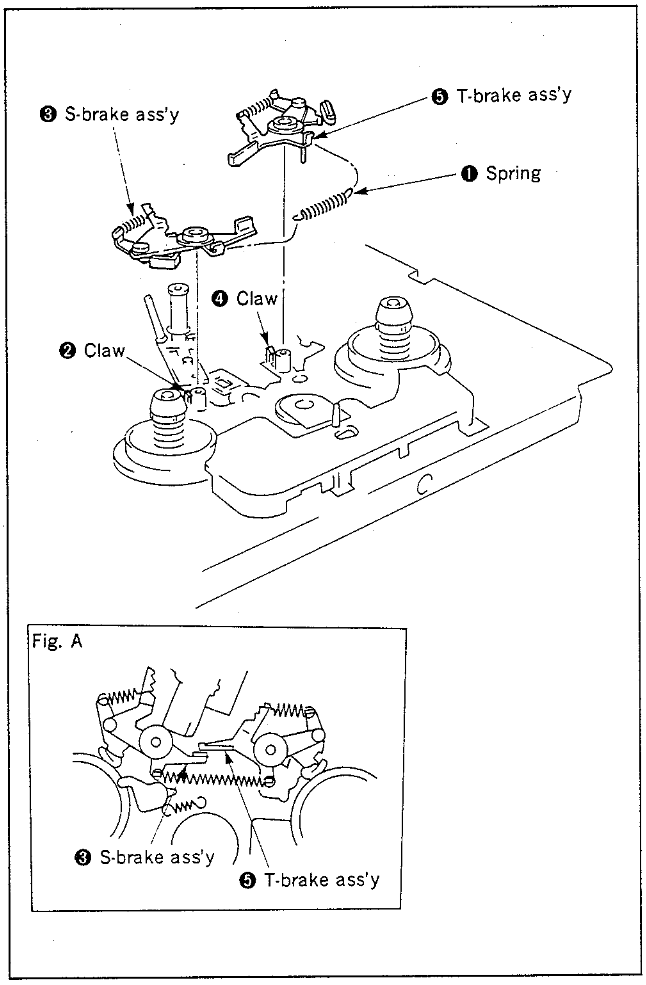

❸ S-brake ass'y
❺ T-brake ass'y
❶ Spring
❹ Claw
❷ Claw
Fig. A
❸ S-brake ass'y
❺ T-brake ass'y

Fig. 3-16.

3-11. T-SOFT BRAKE ASS'Y REV BRAKE ARM (Fig. 3-17)

1) Remove the end of the spring ❶ from the REV brake arm ❷.
2) Remove the end of the spring ❸ from the chassis.
3) Disengage the claw ❹, then pull out the T-soft brake ass'y ❺.
4) Disengage the claw ❻, then pull out the REV brake arm ❷.

[Precautions on remounting]

- ○ Do not touch the brake shoe of the T-soft brake ass'y ❺ directly with your fingers.

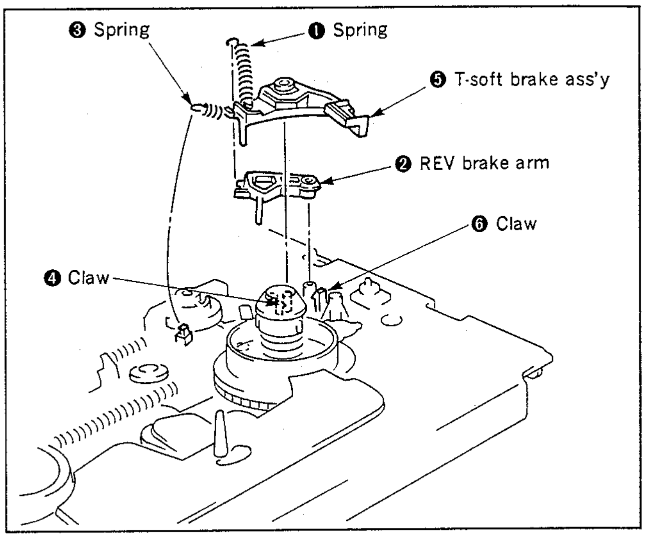

❸ Spring
❶ Spring
❺ T-soft brake ass'y
❷ REV brake arm
❻ Claw
❹ Claw

Fig. 3-17.

3-12. S-SOFT BRAKE ARM ASS'Y (Fig. 3-18)

1) Unhook the end of the spring ❶ from the chassis.
2) Disengage the claw ❷, then pull out the S-soft brake arm ass'y ❸.

[Precautions on remounting]

- ○ The S-soft brake arm ass'y must not clamp down the tension regulator band ass'y ❹ nor be positioned below the tension regulator band ❹.

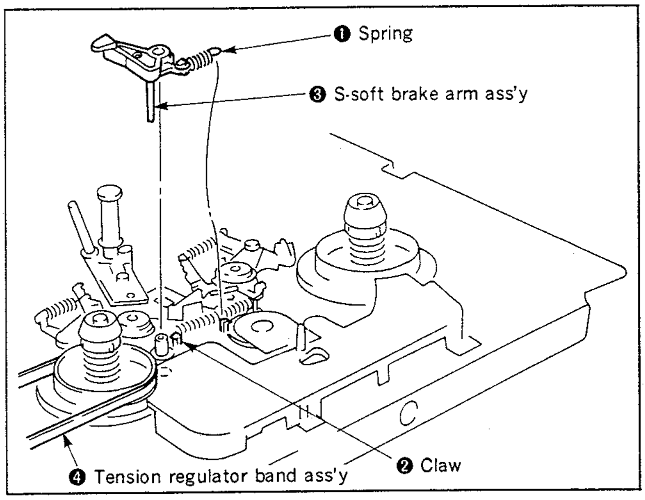

❶ Spring
❸ S-soft brake arm ass'y
❹ Tension regulator band ass'y
❷ Claw

Fig. 3-18.

3-13. S-GUIDE AND T-GUIDE ROLLER ASSY'S (Fig. 3-19)

1) Loosen the setscrew ❶, then remove the S-guide roller ass'y ❷ by turning it in the direction of the arrow Ⓐ.
2) Loosen the setscrew ❸, then remove the T-guide roller ass'y ❹ by turning it in the direction of arrow Ⓑ.

[Precautions on remounting]

○ Clean the surfaces of the S-guide roller ❷ and T-guide roller assy's ❹ where a tape is attached.

[Adjustment after replacement]

○ Perform tape path adjustments as described in 4-1.

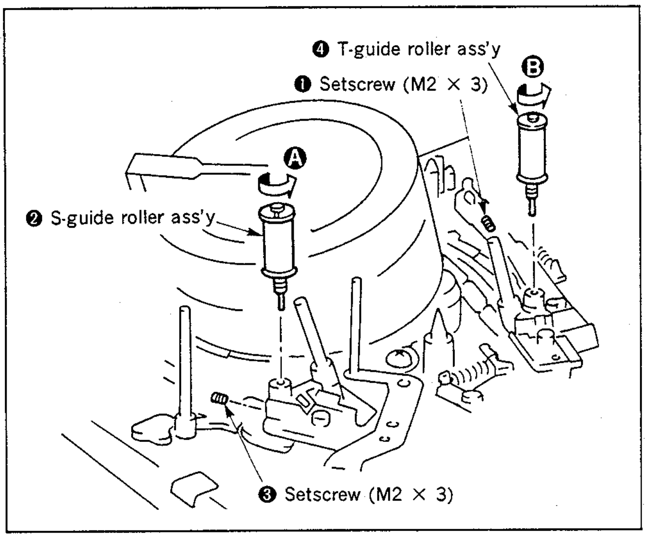

❹ T-guide roller ass'y
❶ Setscrew (M2 × 3)
Ⓑ
Ⓐ
❷ S-guide roller ass'y
❸ Setscrew (M2 × 3)

Fig. 3-19.

3-14. REEL LOCK RELEASE AND REW GEAR (Fig. 3-20)

1) Disengage the two claws ❶, then remove the reel lock release ❷ along with the spring ❸ (while the spring is still attached).
2) Next, pull out the REW gear ❹ with the spring bearing ❺ still attached).

[Precautions on remounting]

○ Make sure that the small thrust bearing ❻ remains attached.

○ Make sure that the two claws ❶ lock the real lock release ❷ in place.

○ Apply 1/2 drop of lubricant to the shaft ❼.

○ Make sure that the spring ❸ adheres to the reel lock release ❷ and that it fits inside the rib of the REW gear ❹.

○ Mount the REW gear ❹ by meshing it with gear ❽.

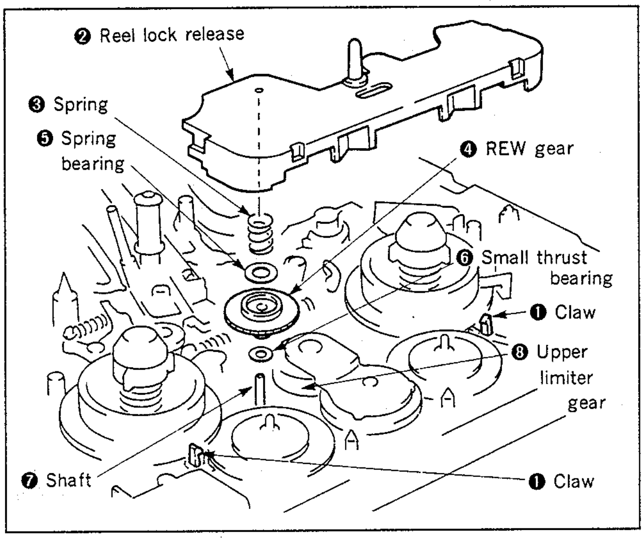

❷ Reel lock release
❸ Spring
❺ Spring bearing
❹ REW gear
❻ Small thrust bearing
❶ Claw
❽ Upper limiter gear
❼ Shaft
❶ Claw

Fig. 3-20.

3-15. TENSION REGULATOR ARM ASS'Y, TENSION REGULATOR BAND ASS'Y (Fig. 3-21)

1) Remove the reel lock release ass'y. (Refer to Fig. 3-14.)
2) Disengage the three claws marked ❶ and the claw marked ❷, then remove the tension regulator band ass'y ❸.
3) Unhook the end of the spring ❹ from the chassis.
4) Disengage the claw ❺, then pull out the tension regulator arm ass'y ❻.

[Precautions on remounting]

- ○ Roll up the tension regulator band ❸ on the S-reel by turning the S-soft brake arm ass'y ❼ in the direction of the arrow.
- ○ Hook the spring ❹ at the center of the spring hook ❽.
- ○ Do not touch the brake shoe of the tension regulator band ass'y ❸ directly with your fingers.
- ○ Mount the tension regulator arm ass'y ❻ at the position shown in Fig. A below.

[Adjustment after replacement]

- ○ Check the back tension. (Refer to 4-1-1.)
- ○ Perform tape path adjustments as described in 4-1.

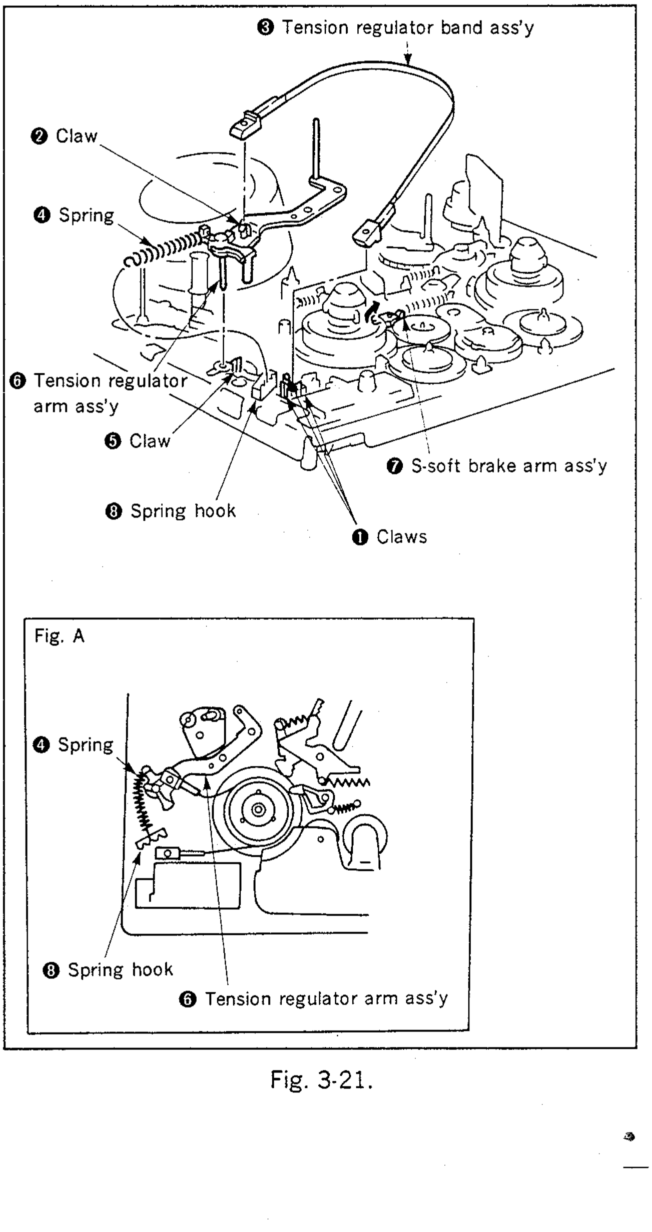

❸ Tension regulator band ass'y
❷ Claw
❹ Spring
❻ Tension regulator arm ass'y
❺ Claw
❼ S-soft brake arm ass'y
❽ Spring hook
❶ Claws
Fig. A
❹ Spring
❽ Spring hook
❻ Tension regulator arm ass'y

Fig. 3-21.

3-16. S TAKE-UP ASS'Y (Fig. 3-22)

1) Remove the tension regulator arm ass'y and the tension regulator band ass'y. (Refer to 3-15.)
2) Unhook the end of the spring ❶ from the S take-up arm ❷.
3) Disengage the two claws ❸, then remove the S take-up ass'y ❹.

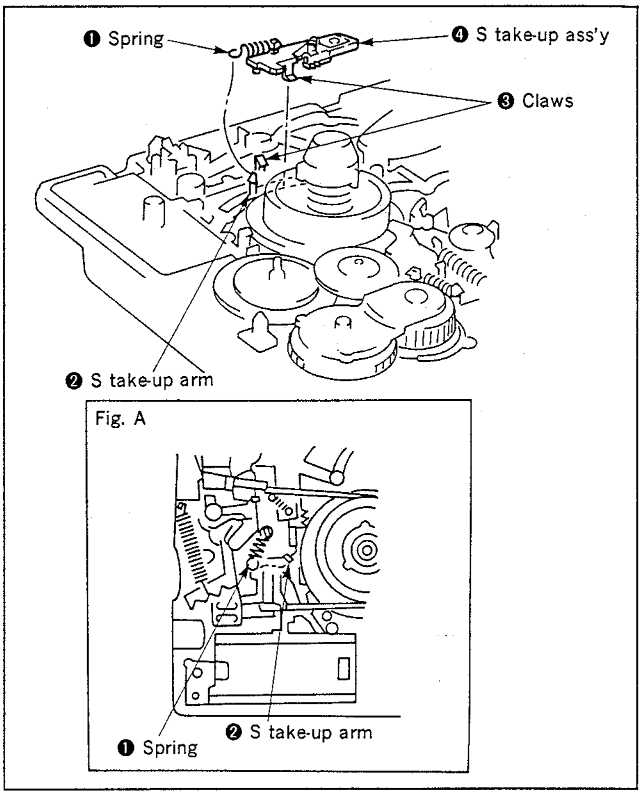

❶ Spring
❹ S take-up ass'y
❸ Claws
❷ S take-up arm
Fig. A
❷ S take-up arm
❶ Spring

Fig. 3-22.

3-17. S-REEL ASS'Y (Fig. 3-23)

1) Remove the S-soft brake arm ass'y. (Refer to 3-12.)
2) Remove the reel lock release. (Refer to 3-14.)
3) Remove the tension regulator band ass'y. (Refer to 3- 15.)
4) Turn the S-brake ass'y ❶ in the direction of the arrow.
5) Pull out the S-reel ass'y ❷.

[Precautions on remounting]

- ○ At least one reel stand thrust bearing ❸ must be attached (but not more than two).
- ○ Do not touch the outer edge of the S-reel ass'y ❷ directly with your fingers.
- ○ Apply 1/2 drop of lubricant over the shaft ❹.
- ○ Mount the S-reel ass'y ❷ while meshing it with the relay gear ❺.

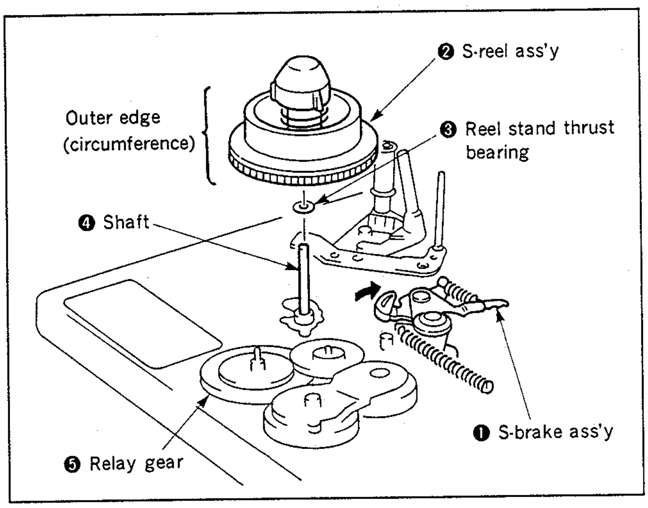

❷ S-reel ass'y
Outer edge (circumference)
❸ Reel stand thrust bearing
❹ Shaft
❶ S-brake ass'y
❺ Relay gear

Fig. 3-23.

3-18. T-REEL ASS'Y (Fig. 3-24)

1) Remove the T-soft brake ass'y. (Refer to 3-11.)
2) Remove the reel lock release ass'y. (Refer to 3-14.)
3) Turn the T-brake ass'y ❶ in the direction of the arrow.
4) Pull out the T-reel ass'y ❷.

[Precautions on remounting]

- ○ At least one reel stand thrust bearing ❸ must be attached (but not more than two).
- ○ Do not touch the outer edge of the T-reel ass'y ❷ directly with your fingers.
- ○ Apply 1/2 drop of lubricant on the shaft ❹.
- ○ Mount the T-reel ass'y ❷ while meshing it with the relay gear ❺.

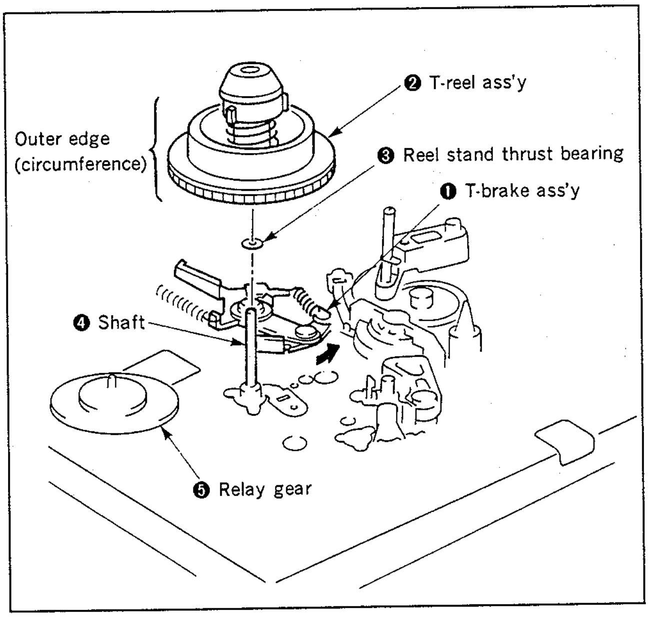

❷ T-reel ass'y
Outer edge (circumference)
❸ Reel stand thrust bearing
❶ T-brake ass'y
❹ Shaft
❺ Relay gear

Fig. 3-24.

3-19. PENDULUM ARM ASS'Y (Fig. 3-25)

1) Remove the reel lock release ass'y. (Refer to 3-14.)
2) Remove the washer 2 ❶, then pull out the pendulum arm ass'y ❷.

[Precautions on remounting]

- ○ Fit the boss on the pendulum cap ❸ into the gap in the pendulum slide plate ❹.
- ○ The plastic slider ❺ must be attzched.
- ○ Apply 1/2 drop of lubricant on the shaft ❻.
- ○ Mount the pendulum arm ass'y ❷ by meshing it with the upper limiter gear ❼.

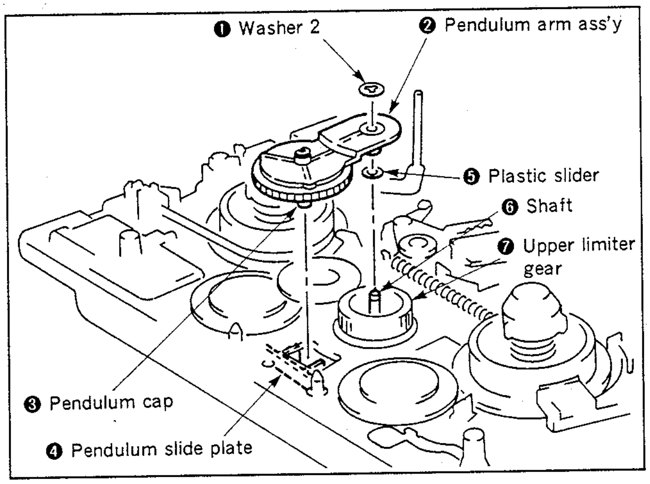

❶ Washer 2
❷ Pendulum arm ass'y
❺ Plastic slider
❻ Shaft
❼ Upper limiter gear
❸ Pendulum cap
❹ Pendulum slide plate

Fig. 3-25.

3-20. RELAY GEAR (Fig. 3-26)

1) Remove the reel lock release and REW gear. (Refer to 3-14.)
2) Remove the S-reel ass'y. (Refer to 3-17.)
3) Remove the T-reel ass'y. (Refer to 3-18).
4) Pull out the two relay gears ❶.

[Precautions on remounting]

- ○ The relay gears ❶ must rotate smoothly after remounting.
- ○ Apply 1/2 drop of lubricant to the respective shafts ❷.

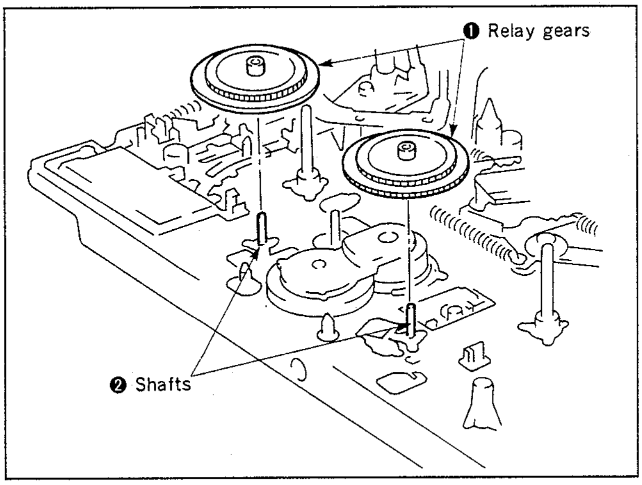

❶ Relay gears
❷ Shafts

Fig. 3-26.

3-21. ADJUSTER ARM ASS'Y (Fig. 3-27)

1) Remove screw ❶.
2) Remove washer ❻.
3) Remove the end of the spring ❷ hooked to the chassis.
4) Remove the end of the timing belt ❸ from the capstan motor arm ass'y.
5) Disengage the claw ❹, then remove the adjuster arm ass'y.

[Precautions on remounting]

- ○ First mount the adjuster arm ass'y ❺, timing belt ❸ and spring ❷, then attach the washer ❻ and fasten the screw ❶.
- ○ The screw fastening torque must be within 5kg•cm (±1kg•cm).

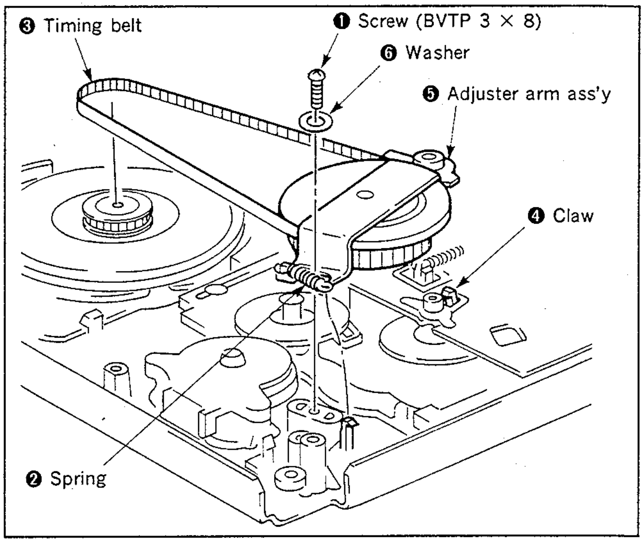

❸ Timing belt
❶ Screw (BVTP 3 × 8)
❻ Washer
❺ Adjuster arm ass'y
❹ Claw
❷ Spring

Fig. 3-27.

3-22. CAP BRAKE ASS'Y (Fig. 3-28)

1) Loosen the screw ❶, then push the timing belt ❷ in the direction of the arrow.
2) Unhook the end of the spring ❸ from the chassis.
3) Disengage claw ❹, then pull out CAP brake ass'y ❺.

[Precautions on remounting]

- ○ Do not touch the brake shoe of the CAP brake ass'y ❺ directly with your fingers.

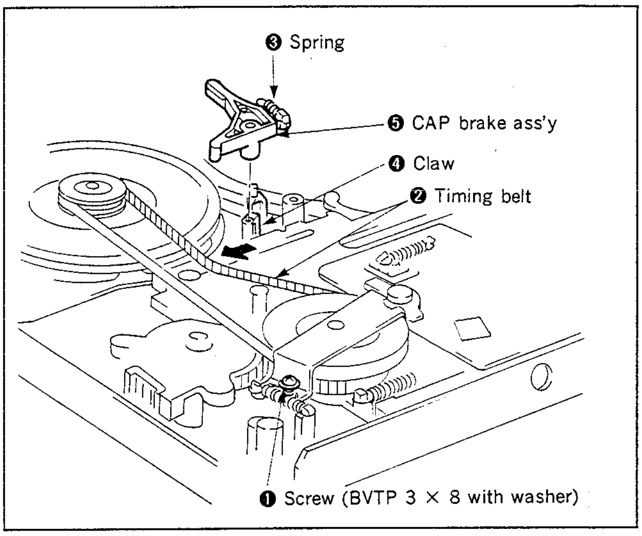

❸ Spring
❺ CAP brake ass'y
❹ Claw
❷ Timing belt
❶ Screw (BVTP 3 × 8 with washer)

Fig. 3-28.

3-23. CAPSTAN MOTOR (Fig. 3-29)

1) Turn the ACE ass'y ❶ in the direction of arrow Ⓐ as shown in Fig. A below, then remove three screws ❷.
2) Remove screw ❸, then remove the rotor clamp ❹.
3) Turn the CAP brake ass'y ❺ in the direction of arrow Ⓑ, then pull out the capstan motor ❻.

[Precautions on remounting]

- ○ Clean the section of the capstan motor ❻ where the tape is attached.
- ○ Do not touch the brake shoe of the CAP brake ass'y ❺ directly with your fingers.
- ○ Of the three screws ❷, first fasten screw A temporarily, then fasten screws B and C firmly, followed by screw A.
- ○ The screw fastening torque must be within 3kg•cm ± 1kg•cm.

[Adjustments after mounting]

- ○ Perform tape path adjustments as described in 4-1.

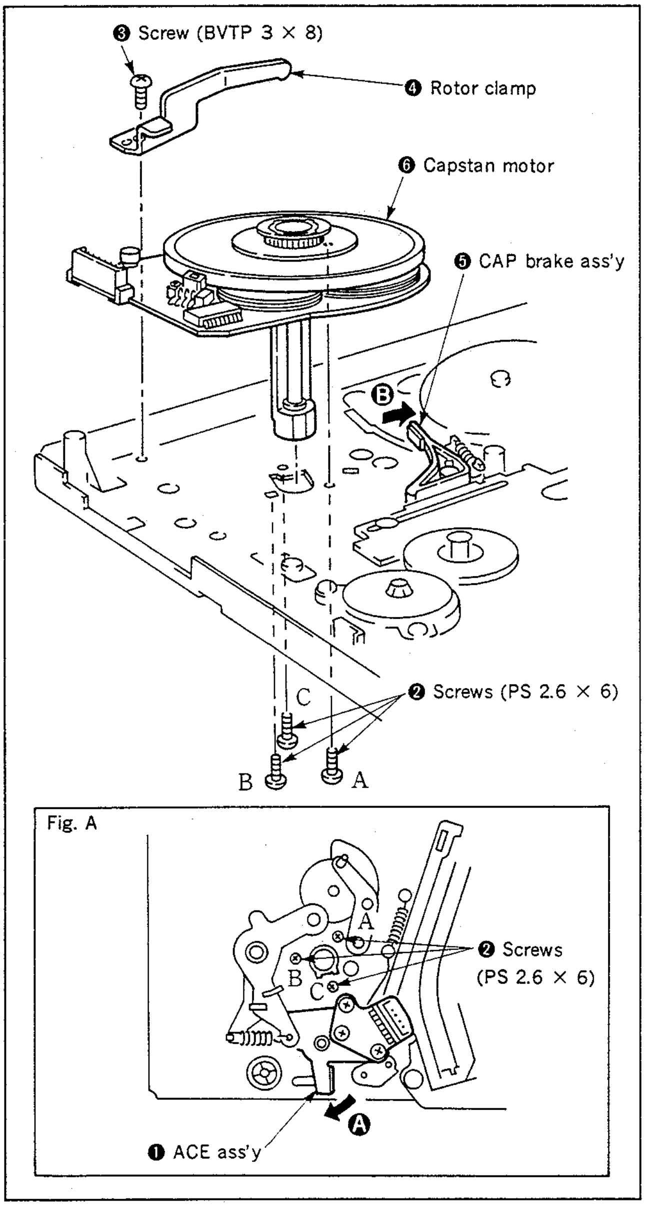

❸ Screw (BVTP 3 × 8)
❹ Rotor clamp
❻ Capstan motor
❺ CAP brake ass'y
Ⓑ
❷ Screws (PS 2.6 × 6)
C
B
A
Fig. A
A
B
C
❷ Screws
(PS 2.6 × 6)
❶ ACE ass'y
Ⓐ

Fig. 3-29.

3-24. ROTARY SWITCH (Fig. 3-30)

1) Remove the adjuster arm ass'y. (Refer to 3-21.)
2) Remove the screws ❶ and ❷, then pull out the rotary switch ❸.

[Precautions on remounting]

- ○ Match up the ● mark on the rotary switch ❸ with the ▲ mark on the RKB cam gear ❹ as shown in Fig. A.
- ○ Match up holes ❻ on the pendulum arm ❺ and the chassis.

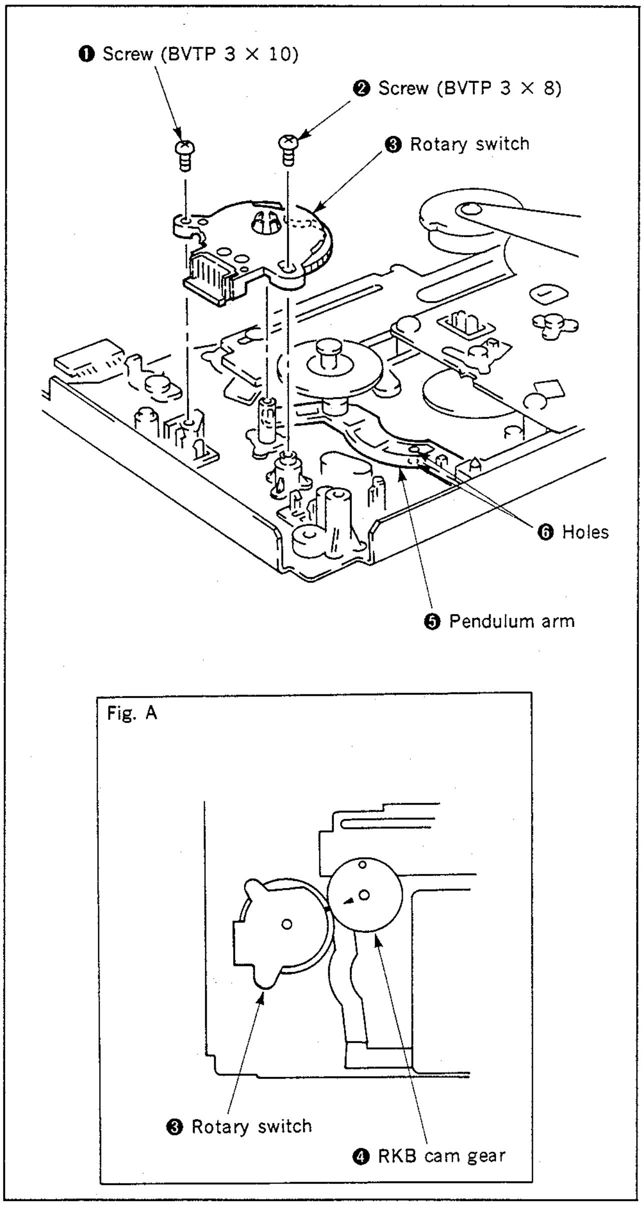

❶ Screw (BVTP 3 × 10)
❷ Screw (BVTP 3 × 8)
❸ Rotary switch
❻ Holes
❺ Pendulum arm
Fig. A
❸ Rotary switch
❹ RKB cam gear

Fig. 3-30.

3-25. RKB CAM GEAR (Fig. 3-31)

1) Remove the adjuster arm ass'y. (Refer to 3-22.)
2) Remove washer 2 ❶, then pull out the RKB cam gear ❷.

[Precautions on remounting]

○ When the limiter arm ❸ is pushed in the direction of the arrow, the pin must fit into the notch on the RKB cam gear ❷.
○ The ■ mark on rotary switch ❺ must match up with the ◀ mark on the RKB cam gear ❷ as shown in Fig. A.
○ Apply 1/2 drop of lubricant to shaft ❻.
○ Match up the holes ❹ on the RKB cam gear ❷ and the mode slide plate.

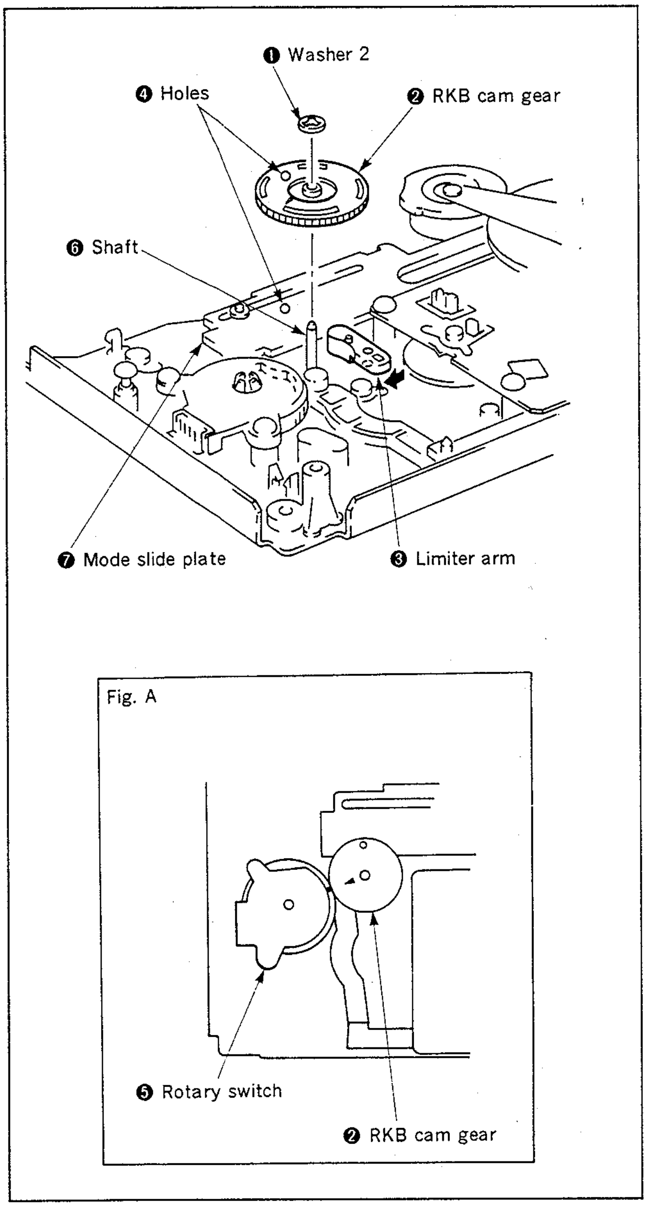

❶ Washer 2
❹ Holes
❷ RKB cam gear
❻ Shaft
❼ Mode slide plate
❸ Limiter arm
Fig. A
❺ Rotary switch
❷ RKB cam gear

Fig. 3-31.

3-26. SUB-CHASSIS ASS'Y (Fig. 3-32)

1) Remove the reel lock release arm and REW gear. (Refer to 3-15.)
2) Remove the pendulum arm ass'y. (Refer to 3-19.)
3) Remove the adjuster arm ass'y. (Refer to 3-22.)
4) Remove the three screws ❶, then remove sub-chassis ass'y ❷.

[Precautions on remounting]

○ The switching arm ❸ must be switched in the direction of the arrow.
○ The screws must be fastened in order of a, b and c.
○ Mount the sub-chassis carefully so as not to damage the gear.
○ The corner edge of the lug terminal ❹ must fit into the gap between the chassis ass'y ❷ and mechanism chassis.

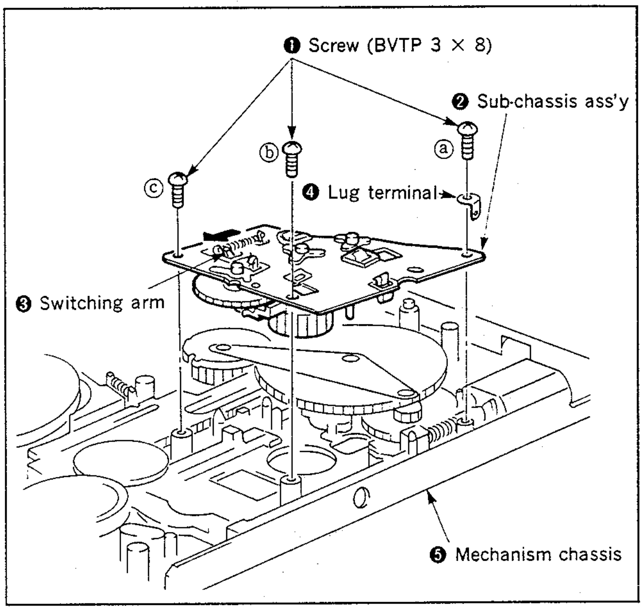

❶ Screw (BVTP 3 × 8)
❷ Sub-chassis ass'y
ⓐ
ⓑ
ⓒ
❹ Lug terminal
❸ Switching arm
❺ Mechanism chassis

Fig. 3-32.

3-27. PENDULUM SLIDE PLATE, PENDULUM ARM (Fig. 3-33)

1) Remove the rotary switch. (Refer to 3-24.)
2) Remove the RKB cam gear. (Refer to 3-25.)
3) Remove the sub-chassis ass'y. (Refer to 3-26.)
4) Disengage the two claws ❶, then pull out the pendulum slide plate ❷.
5) Unhook the spring ❸.
6) Disengage the claw ❹, then pull out pendulum arm ❺.

[Precautions on remounting]

○ The shaft ❻ must fit into hole ❼.

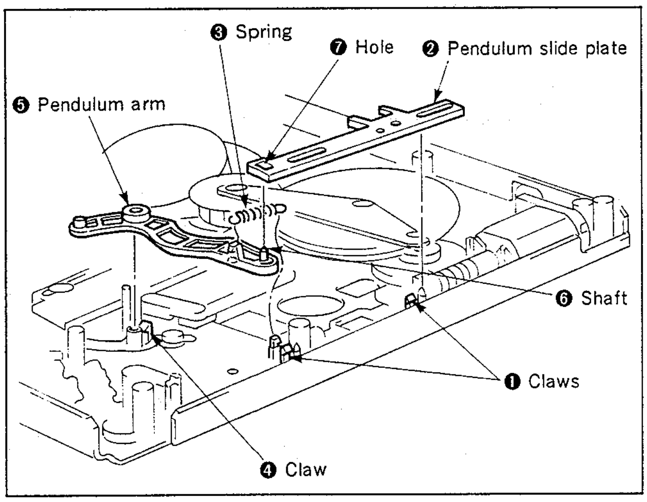

❸ Spring
❼ Hole
❷ Pendulum slide plate
❺ Pendulum arm
❻ Shaft
❶ Claws
❹ Claw

Fig. 3-33.

3-28. THE LIMITER ARM AND LIMITER SLIDE PLATE (Fig, 3-24)

1) Remove the RKB cam gear. (Refer to 3-25.)
2) Remove the sub-chassis. (Refer to Fig. 3-26.)
3) Disengage the claw ❶, then pull out the limiter arm ❷.
4) Disengage the two claws ❸, then pull out the limiter slide plate ❹.

[Precautions on remounting]

○ The shaft ❺ must fit into the hole ❻.

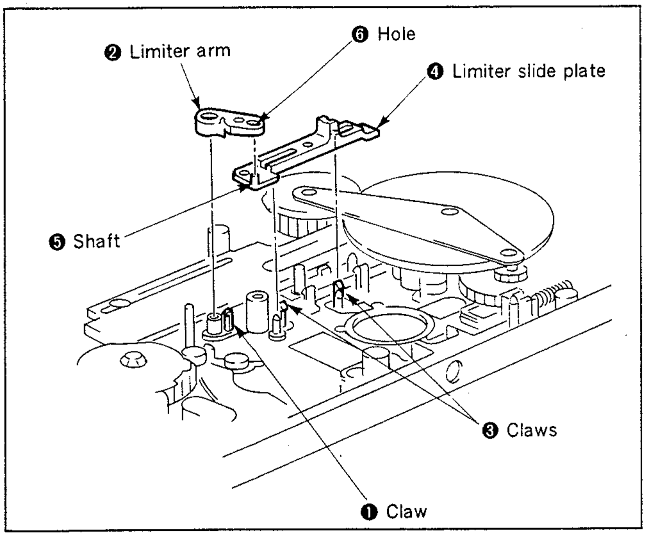

❷ Limiter arm
❻ Hole
❹ Limiter slide plate
❺ Shaft
❸ Claws
❶ Claw

Fig. 3-34.

3-29. CAM MOTOR (Fig. 3-35)

1) Remove the sub- chassis ass'y. (Refer to 3-26.)
2) Disengage the six claws ❶, then remove the cam motor ❷ and worm gear ❸.

[Precautions on remounting]

○ Check the meshing of cam motor ❷ and worm gear ❸.

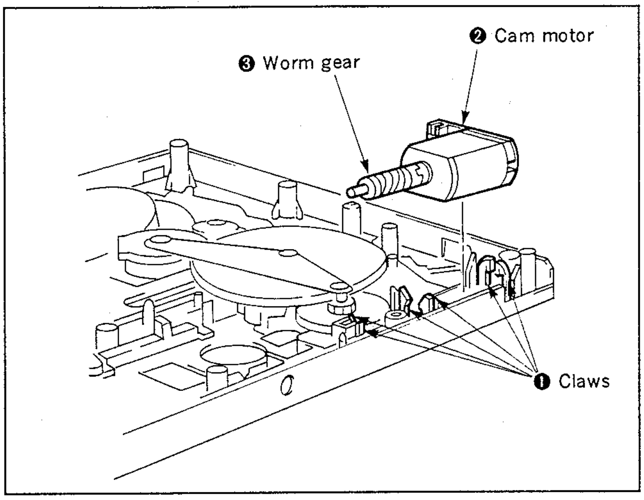

❷ Cam motor
❸ Worm gear
❶ Claws

Fig. 3-35.

3-30. CAM GEAR (Fig. 3-36)

1) Remove the three washers 2 ❶, then pull out the cam gear holder ❷.
2) Pull out the cam gear ❸.

[Precautions on remounting]

○ Match up the right loading gear ass'y, the tension regulator arm, the S take-up arm, the work wheel, the brake arm and the mode slide plate with respective holes ❹ to ❾ on the chassis in that order.

○ Match up the hole ❿ on the mode slide plate with the hole ❿ in cam gear ❸.

○ Apply 1/2 drop of lubricant to the shaft ⓫.

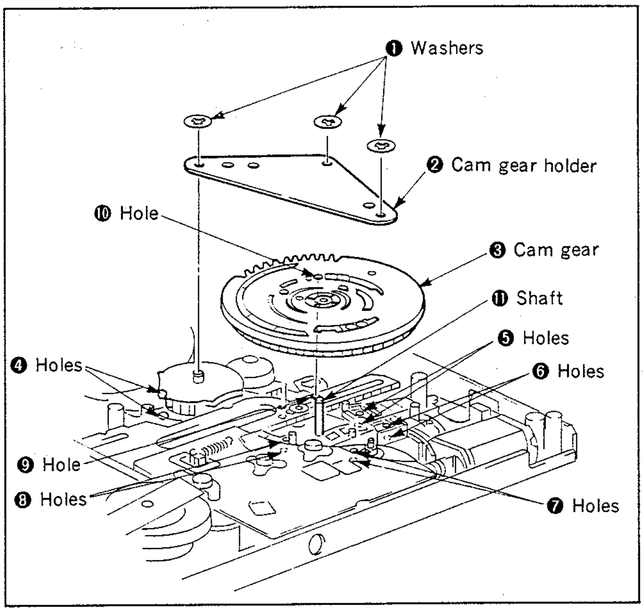

❶ Washers
❷ Cam gear holder
❿ Hole
❸ Cam gear
⓫ Shaft
❺ Holes
❻ Holes
❹ Holes
❾ Hole
❽ Holes
❼ Holes

Fig. 3-36.

3-31. TENSION REGULATOR ARM, S TAKE-UP ARM (Fig. 3-37)

1) Remove the cam gear. (Refer to 3-30)
2) Disengage the claw ❶, then remove the tension regulator arm ❷.
3) Remove the end of the spring ❸ from the S take-up arm ❹.
4) Disengage the claw ❺, then pull out S take-up arm ❹.

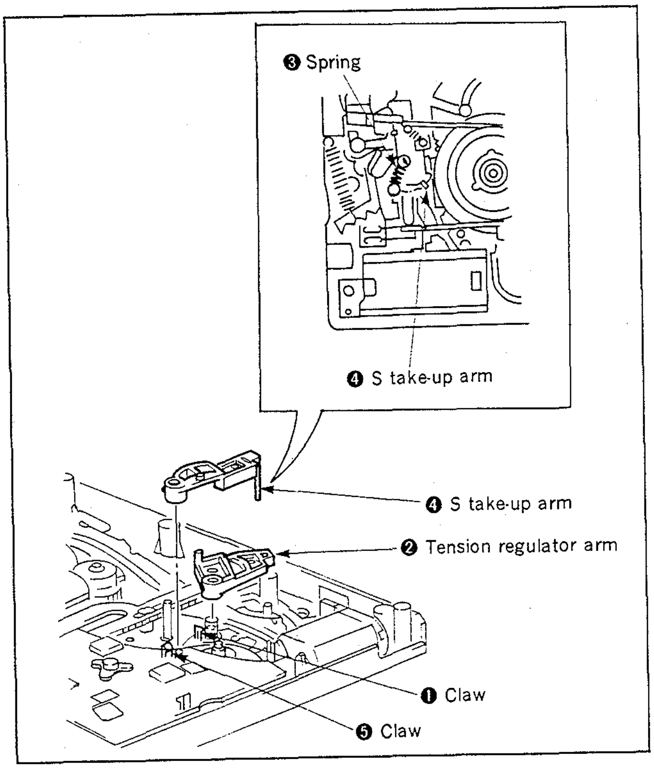

❸ Spring
❹ S take-up arm
❹ S take-up arm
❷ Tension regulator arm
❶ Claw
❺ Claw

Fig. 3-37.

3-32. MODE SLIDE PLATE, RVS RELAY GEAR (Fig. 3-38)

1) Remove the RKB cam gear. (Refer to 3-25.)
2) Remove the cam gear. (Refer to 3-30.)
3) Remove the two washers 2 ❶.
4) Turn the CAP brake ❷ in the direction of the arrow, then pull out mode slide plate ❸.
5) Pull out the RVS relay gear ❹.

[Precautions on remounting]

○ Match up the hole ❺ on the RVS relay gear ❹ with hole ❺ in the chassis.
○ Match up the holes ❻ on the mode slide plate ❸ with holes ❻ in the chassis.
○ Apply 1/2 drop of lubricant to the shaft ❼.

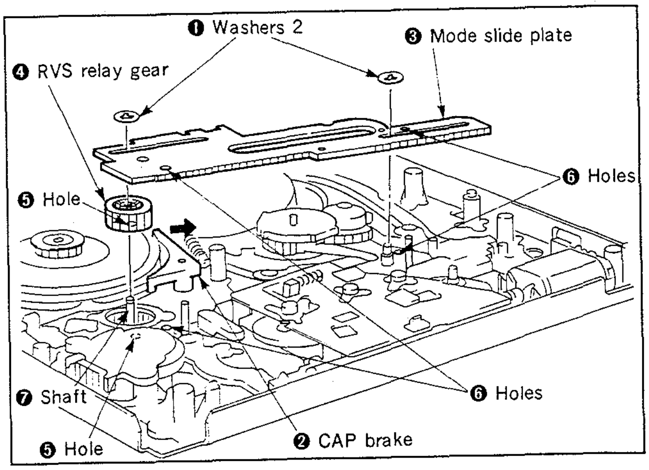

❶ Washers 2
❸ Mode slide plate
❹ RVS relay gear
❻ Holes
❺ Hole
❼ Shaft
❻ Holes
❷ CAP brake
❺ Hole

Fig. 3-38.

3-33. BRAKE ARM, BRAKE SLIDE PLATE (Fig. 3-39)

1) Remove the sub-chassis. (Refer to 3-26.)
2) Remove the cam gear. (Refer to 3-30.)
3) Disengage the claw ❶, then pull out the brake arm ❷.
4) Disengage the two claws ❸, then pull out the brake slide plate ❹.

[Precautions on remounting]

○ Insert the shaft ❺ into hole ❻.

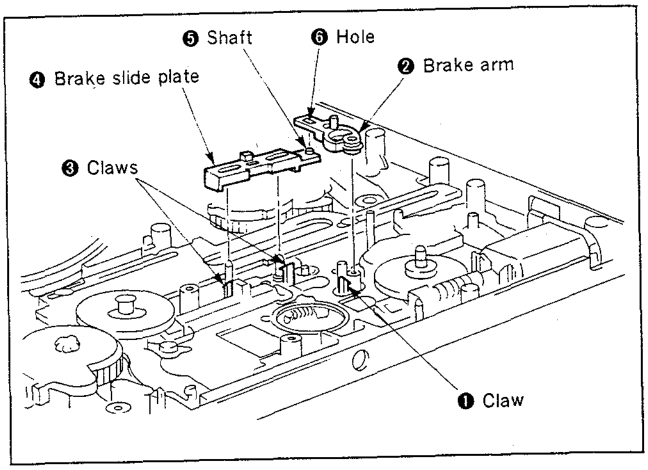

❺ Shaft
❻ Hole
❷ Brake arm
❹ Brake slide plate
❸ Claws
❶ Claw

Fig. 3-39.

3-34. RIGHT SHUTTLE, RIGHT LOADING GEAR ASSY'S (Fig. 3-40)

1) Remove the mode slide plate. (Refer to 3-32.)
2) Remove the plastic slider ❶, then pull out the right shuttle ass'y ❷.
3) Pull out the right loading gear ass'y ❸.

[Precautions on remounting]

- Match up the ▲ mark on the right loading gear ass'y ❸ with the ▲ mark on the left loading gear ass'y ❹ as shown in Fig. A below.
- Apply 1/2 drop of lubricant to the shaft ❺.
- Do not hold on to the arm when pressing on the right loading gear ❸.
- Clean the section of the right shuttle ass'y ❷ where the tape is attached.

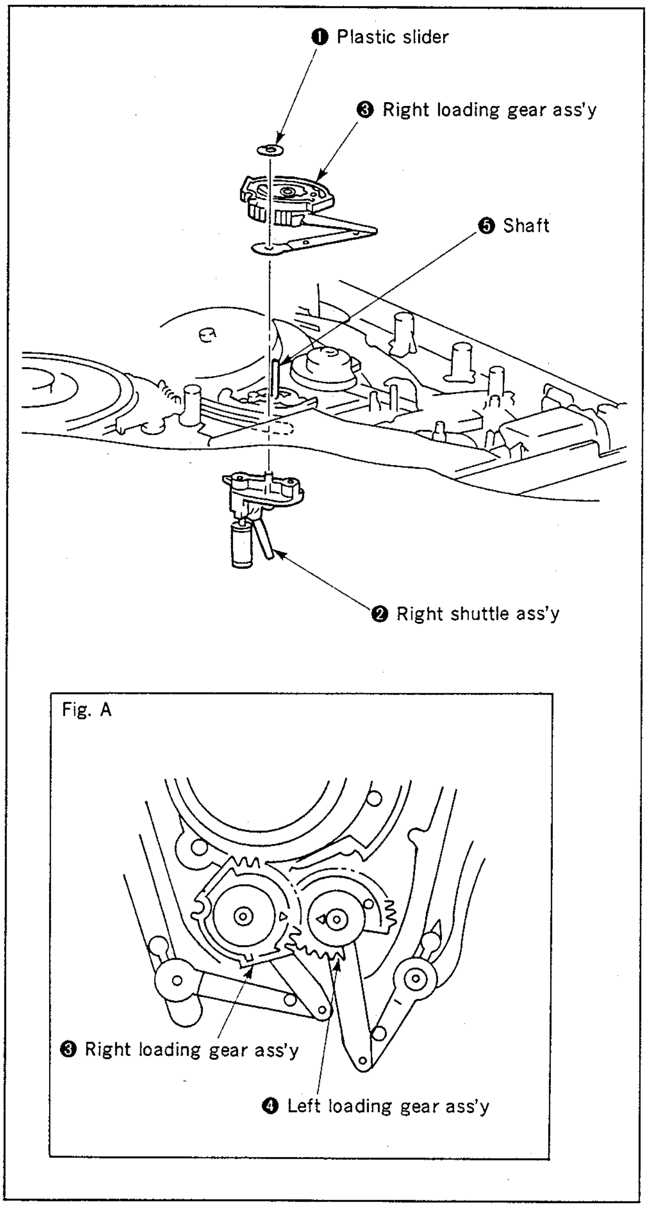

❶ Plastic slider
❸ Right loading gear ass'y
❺ Shaft
❷ Right shuttle ass'y
Fig. A
❸ Right loading gear ass'y
❹ Left loading gear ass'y

Fig. 3-40.

3-35. LEFT SHUTTLE ASS'Y, LEFT LOADING GEAR ASS'Y (Fig. 3-41)

1) Remove the right shuttle ass'y and right loading gear ass'y. (Refer to 3-34.)
2) Remove the plastic slider ❶, then pull out the left shuttle ass'y ❷.
3) Remove washer 2 ❸, then pull out the left loading gear ass'y ❹.

[Precautions on remounting]

- Apply 1/2 drop of lubricant to shaft ❺.
- The tension regulator arm ass'y ❻ and left shuttle ass'y ❷ must be positioned as shown in Fig. A below.
- Do not hold on to the arm of the left loading gear ass'y ❹ when the left loading gear ass'y ❹ is pressed.
- Clean the section of the felt shuttle ass'y ❷ where the tape is attached.

[Adjustments after replacement]

- Perform tape path adjustments as described in 4-1.

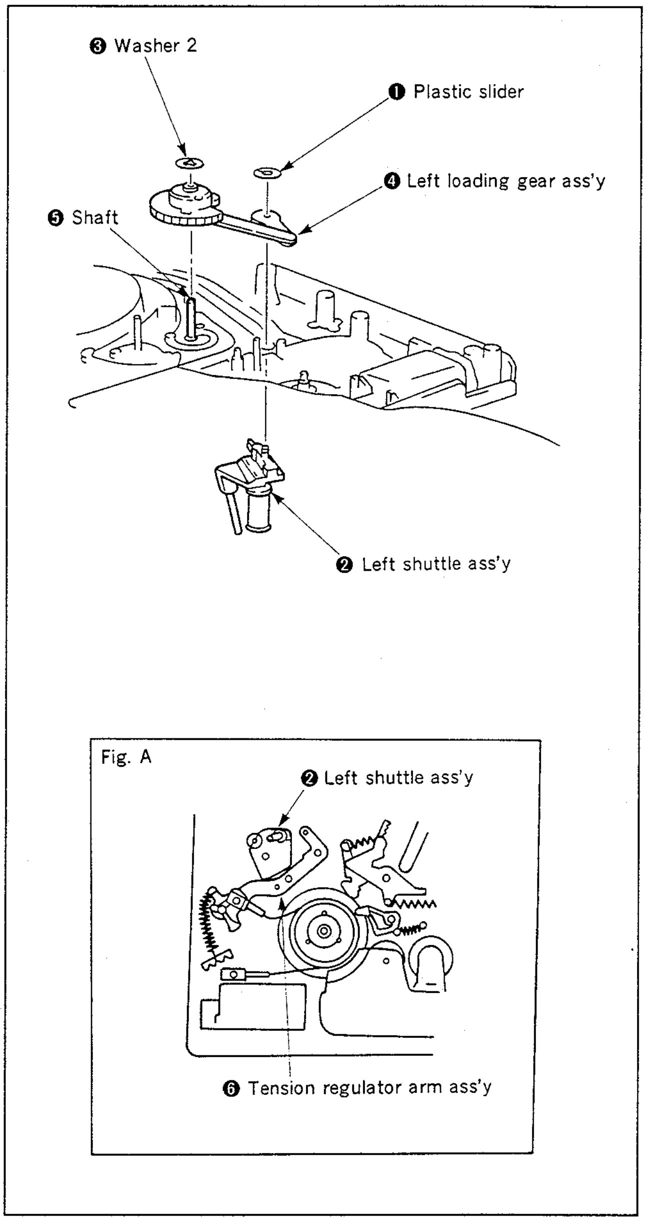

❸ Washer 2
❶ Plastic slider
❹ Left loading gear ass'y
❺ Shaft
❷ Left shuttle ass'y
Fig. A
❷ Left shuttle ass'y
❻ Tension regulator arm ass'y

Fig. 3-41.

3-36. C-ROLLER ARM ASS'Y, C-ROLLER RELEASE LEVER (Fig. 3-42)

1) Disengage the claw ❶, then pull out the C-roller arm ass'y ❷.
2) Unhook the end of the spring ❸ from the chassis.
3) Disengage the two claws ❹, then pull out the C-roller release lever ❺.

[Precautions on remounting]

○ Mount C-roller arm ass'y ❷ so that the hole ❻ on the C-roller arm ass'y ❷ fits into the boss ❼ on the C-roller release lever ❺.

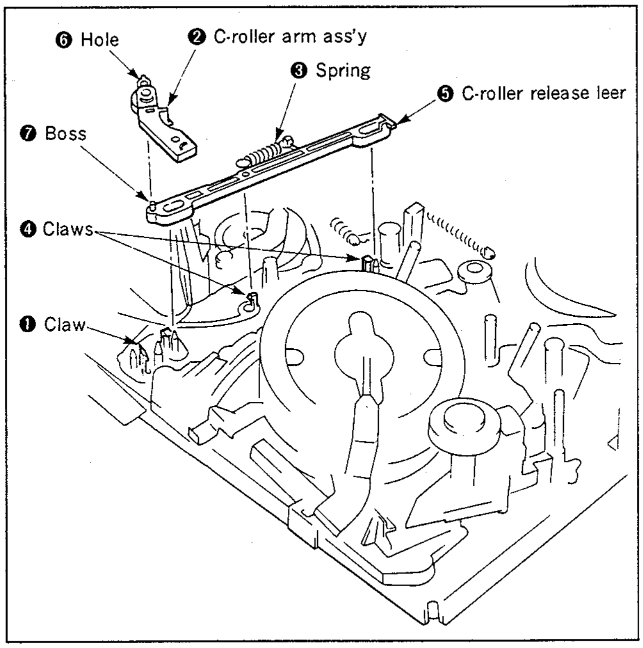

❻ Hole
❷ C-roller arm ass'y
❸ Spring
❺ C-roller release leer
❼ Boss
❹ Claws
❶ Claw

Fig. 3-42.

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads. Each component part of the tape transport system, particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory preadjusted. when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. Tension regulator position/tension adjustment (Fig. 4-1.)

Purpose : Stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

- **Position adjustment**

Mode	Threading is completed without a cassette loaded. (Refer to section 1-2.)
Adjustment locations	Tension band holder

[Adjustment method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the VTR unit to playback, then turn the tension band adjuster lever so that the gap between guide No. 0 and tension arm is within 4.5±0.4mm. *(Set the unit to playback without a cassette loaded.)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

- **Tension adjustment**

Mode	Playback
Measuring instrument/tool	Torque cassette
Adjustment locations	Position for hooking the tension spring
Specification	28 to 34 g•cm

[Adjustment method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards: Move the spring toward direction Ⓐ.
When the reading is less than the standards: Move the spring toward direction Ⓑ.

Note : Move the spring to the tension spring hook position and recheck the tension arm position. If the arm position is misaligned, adjust the position and tension of the tension arm.

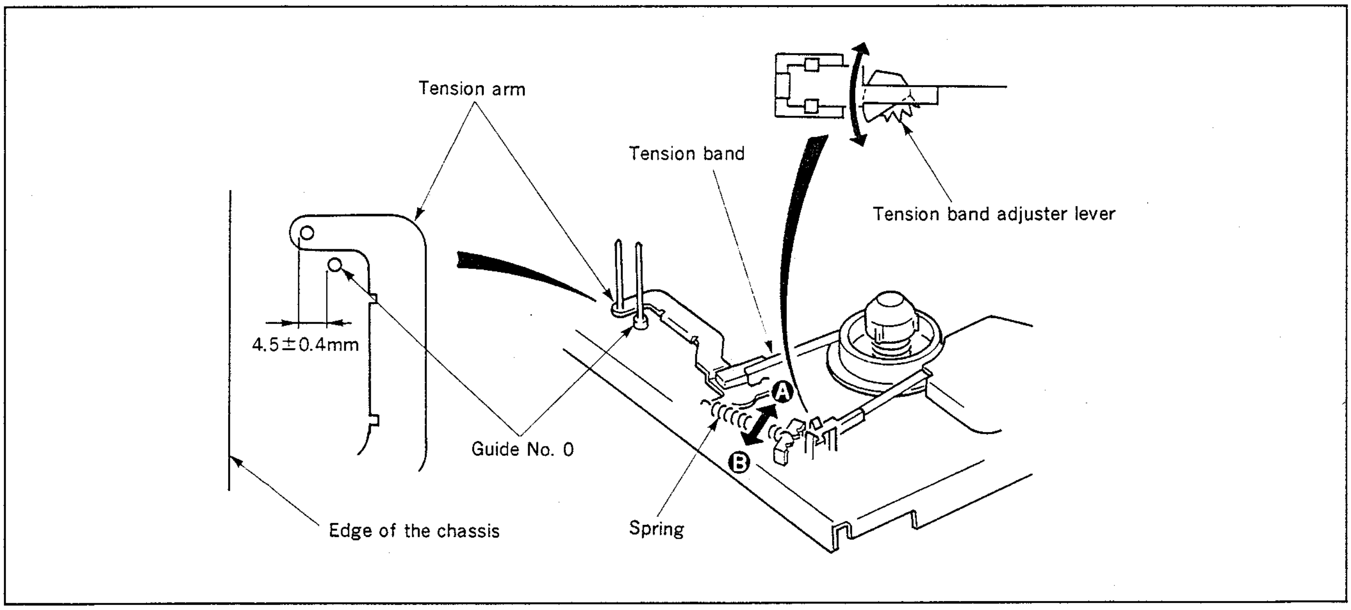


Fig. 4-1.

4-1-2. Height adjustment of the guide roller No. 2 (Fig. 4-2)

Mode	Playback
Tool	Blank tape
Adjustment locations	Guide roller height adjuster screw

[Adjustment method]

1) Load a new tape in the unit, then play it back.
2) Make sure that the lower flange of guide roller No. 2 does not curl up.
3) When the tape curls up : Turn the guide roller adjuster screw clockwise.
   When the tape does not fit into the lower flange : Turn the guide roller adjuster screw counter-clockwise.
4) After the above check, separate the tension arm from the tape, then re-attach it slowly. At this time, check if the tape curls up at the lower flange of the guide roller No. 2 and if the curl disappears within 2 seconds.
5) If curl does not disappear in two seconds : Turn the adjuster screw clockwise.
   If the tape does not curl up : Turn the adjuster screw counter-clockwise.

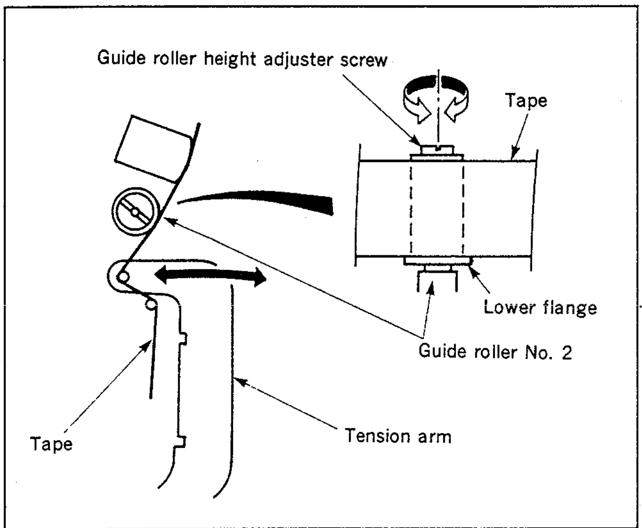


Fig. 4-2.

4-1-3. Height adjustment of guide roller No. 7 and the RVS arm (Fig. 4-3.)

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut

[Adjustment method]

1) Load the tape into the VTR and play it back, then adjust the height of the guide roller No. 7 so that the tape runs along the lower flange of guide roller No. 7.
2) If the guide roller is too low : Turn the height adjuster nut counter-clockwise.
   If the guide roller is too high : Turn the height adjuster nut clockwise.
3) Run the tape in REV, then adjust the height of the RVS arm so that the tape runs along guide roller No. 7.
4) If the tape gets caught in the upper flange of guide roller No. 7 : Turn the RVS arm height adjuster nut clockwise.
5) If the tape catches on the lower flange of guide roller No. 7 : Turn the RVS arm height adjuster nut counter-clockwise.

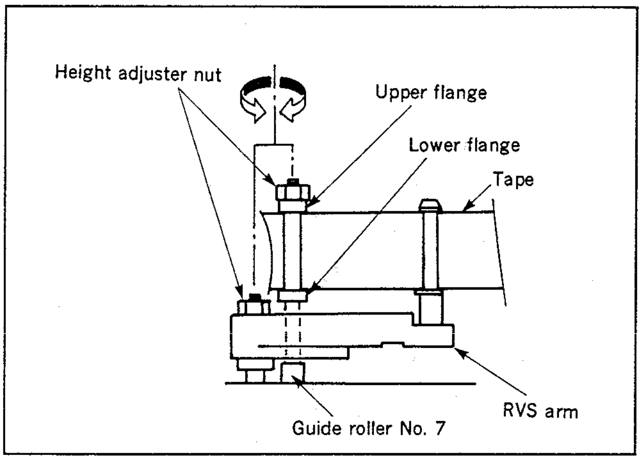


Fig. 4-3.

4-1-4. Height adjustment of guide rollers No. 3 and No. 6 (Fig. 4-4)

Mode	Playback
Signal	Hi-Fi alignment tape (Hi-Fi 400Hz)
Measuring instrument	Oscilloscope
Measuring point	CH-1 : Connector PB RF pin for RF PC board check. CH-2 : Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller height adjuster screw.

[Adjustment method]

1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons ▽ and △ simultaneously to set the tracking at the center position.
   (If adjustment is made after the drum is replaced, the tracking must be set at the max. Rf output position.)
2) Height adjuster screw: Even out the RF output waveforms.
3) Press the tracking buttons (playback), ▽ and △ alternately.
4) Check that RF output drops the same amount at the front and rear edges.

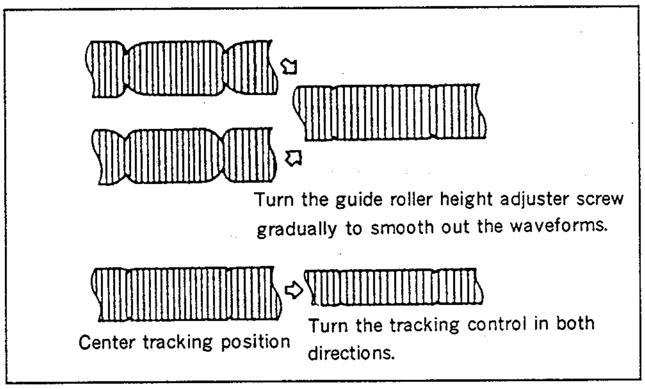

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 4-4.

4-1-5. ACE head ass'y adjustment (rough adjustment) (Figs. 4-5 and 4-6)

Purpose : Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut, tilt adjuster screw

[Adjustment method]

1) Mount the ACE head ass'y. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or raise up noticeably near the ACE head.
4) If the yape curls up or rarises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

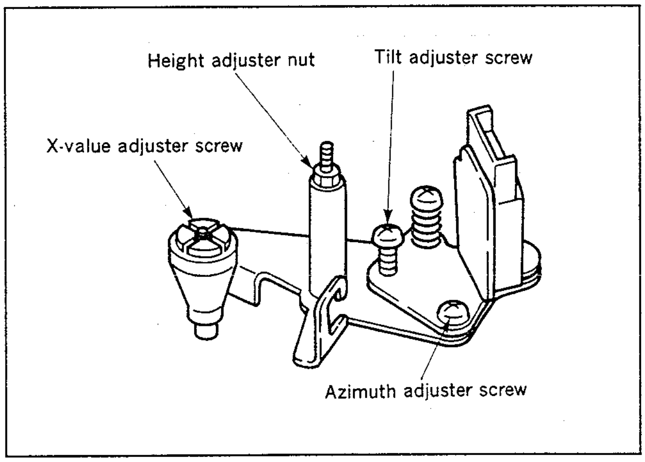

Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Azimuth adjuster screw

Fig. 4-5.

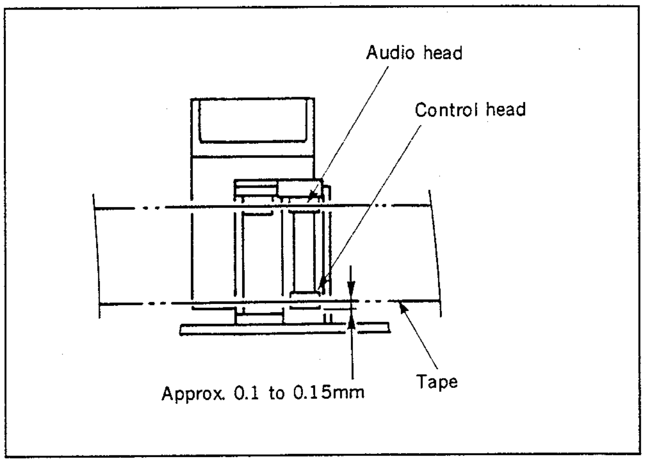

Audio head
Control head
Approx. 0.1 to 0.15mm
Tape

Fig. 4-6.

4-1-6. ACE head assembly adjustment (precision adjustment)

Mode	Playback
Signal	Alignment tape (JVC-MH-1 1KHz)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw Height adjuster nut Tilt adjuster screw

[Adjustment method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or raise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

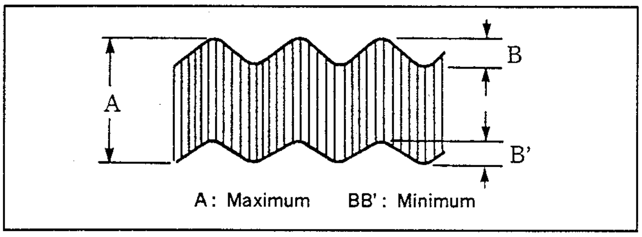

A
B
B'
A: Maximum
BB': Minimum

Fig. 4-7.

4-1-7. X-value adjustment

Purpose : To obtain compatibility with other VTR.

Precaution : Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)
Turn off the auto tracking and set the VTR for manual tracking mode.

Mode	Playbadk
Signal	Hi-Fi alignment tape (Hi-Fi 400Hz), alignment tape (JVC-MH-1)
Measuring instrument	Oscilloscope
Measuring point	CH-1 : Connector PB RF pin for RF PC board check. CH-2 : Connector RF SW P pin for RF PC board check. (Check with the CHA head)
Adjustment locations	X-value adjuster screw

[Adjustment method]

- **Adjustment by Hi-Fi alignment tape**

  When the tracking is set at the center position (by pressing the ▽ and △ keys simultaneously), adjust the RF output to maximum.

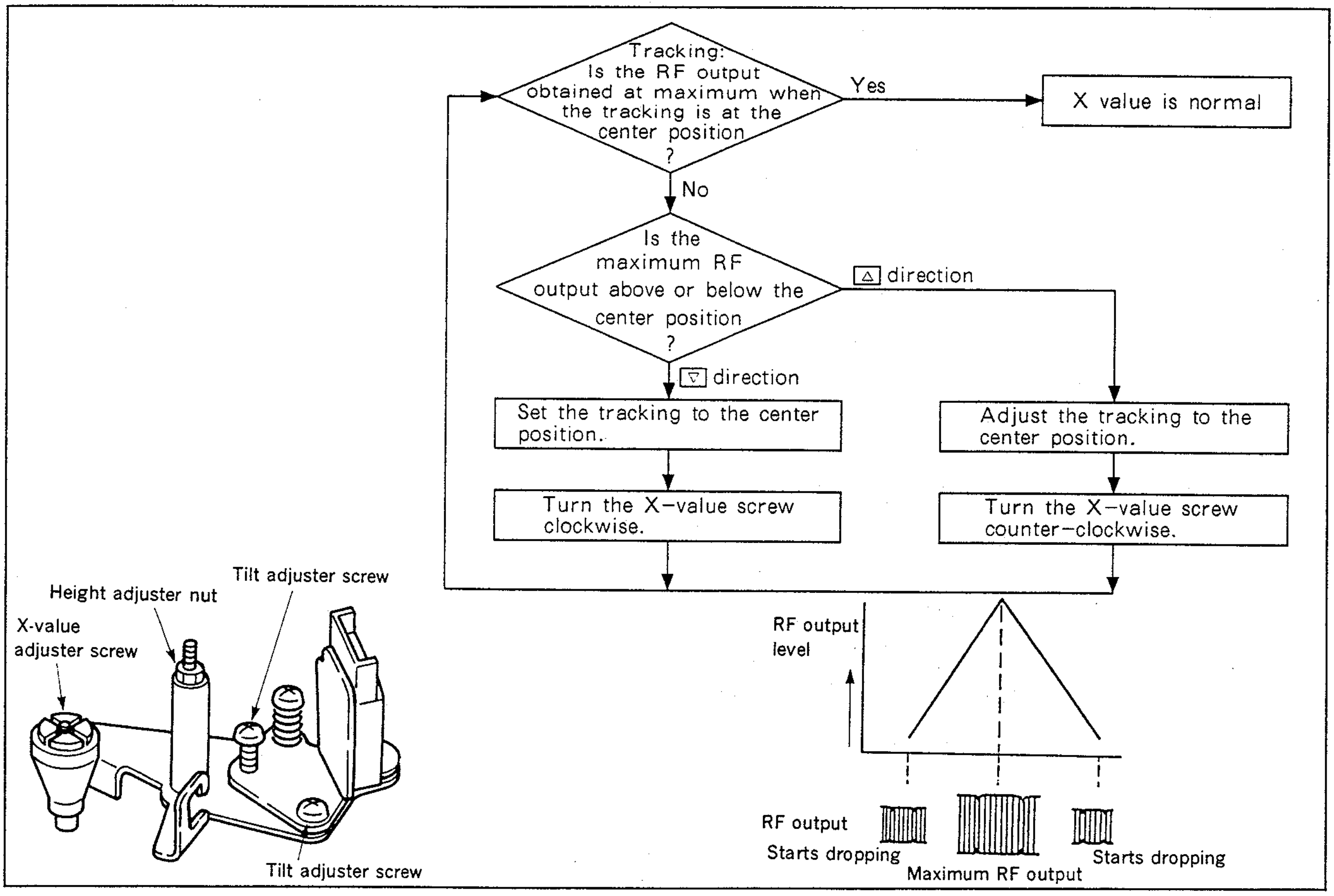

Tracking:
Is the RF output obtained at maximum when the tracking is at the center position ?
Yes
X value is normal
No
Is the maximum RF output above or below the center position ?
△ direction
▽ direction
Set the tracking to the center position.
Turn the X-value screw clockwise.
Adjust the tracking to the center position.
Turn the X-value screw counter-clockwise.
Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Tilt adjuster screw
RF output level
RF output
Starts dropping
Maximum RF output
Starts dropping

Fig. 4-8.

- **Adjustment by Alignment tape (JVC-MH-1)**

Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and △ buttons while the tracking is set at the center position.

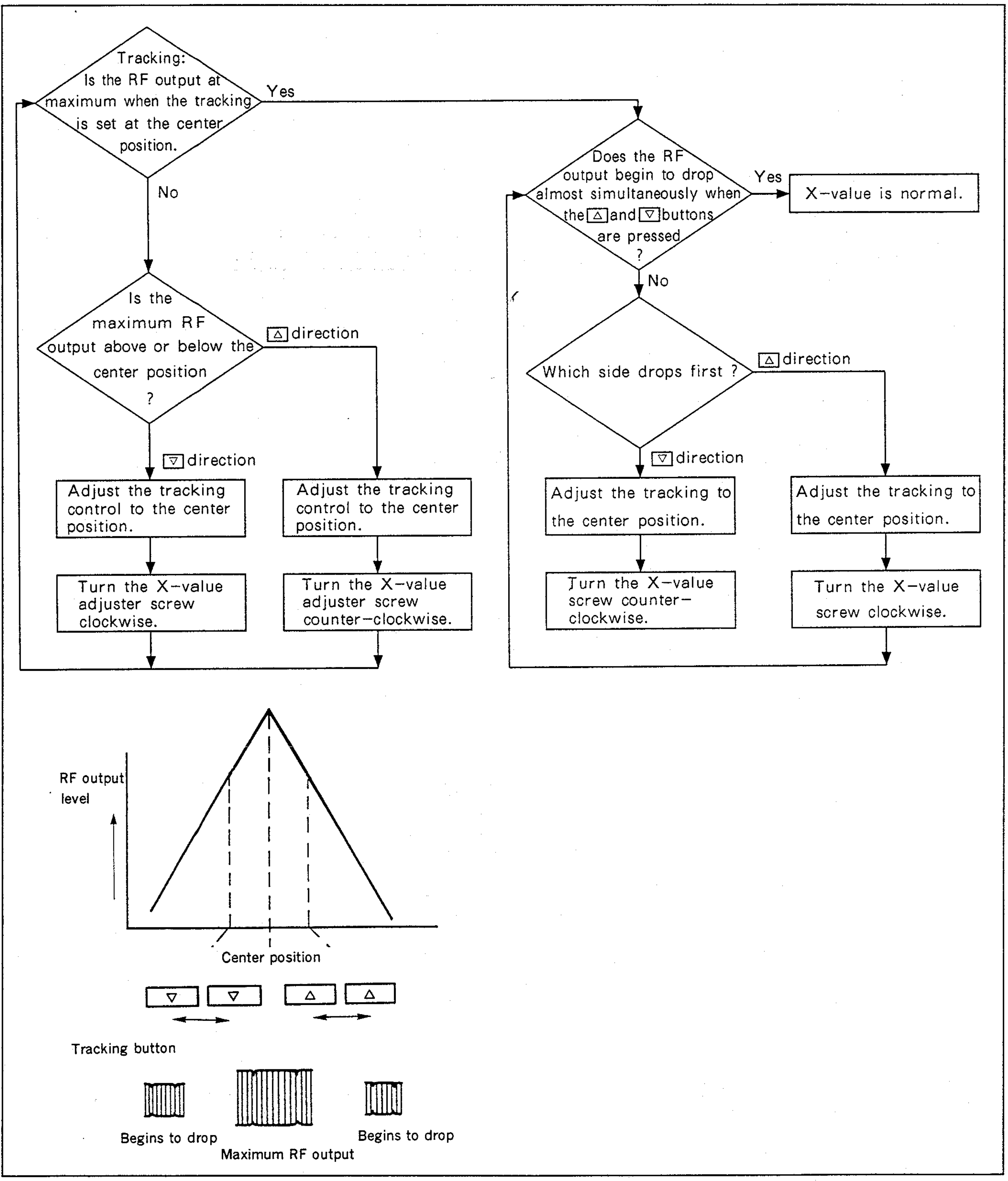

Tracking: Is the RF output at maximum when the tracking is set at the center position.
Yes
No
Is the maximum RF output above or below the center position ?
△ direction
▽ direction
Adjust the tracking control to the center position.
Turn the X-value adjuster screw clockwise.
Adjust the tracking control to the center position.
Turn the X-value adjuster screw counter-clockwise.
Does the RF output begin to drop almost simultaneously when the △ and ▽ buttons are pressed ?
Yes
X-value is normal.
No
Which side drops first ?
△ direction
▽ direction
Adjust the tracking to the center position.
Turn the X-value screw counter-clockwise.
Adjust the tracking to the center position.
Turn the X-value screw clockwise.
RF output level
Center position
▽
▽
△
△
Tracking button
Begins to drop
Maximum RF output
Begins to drop

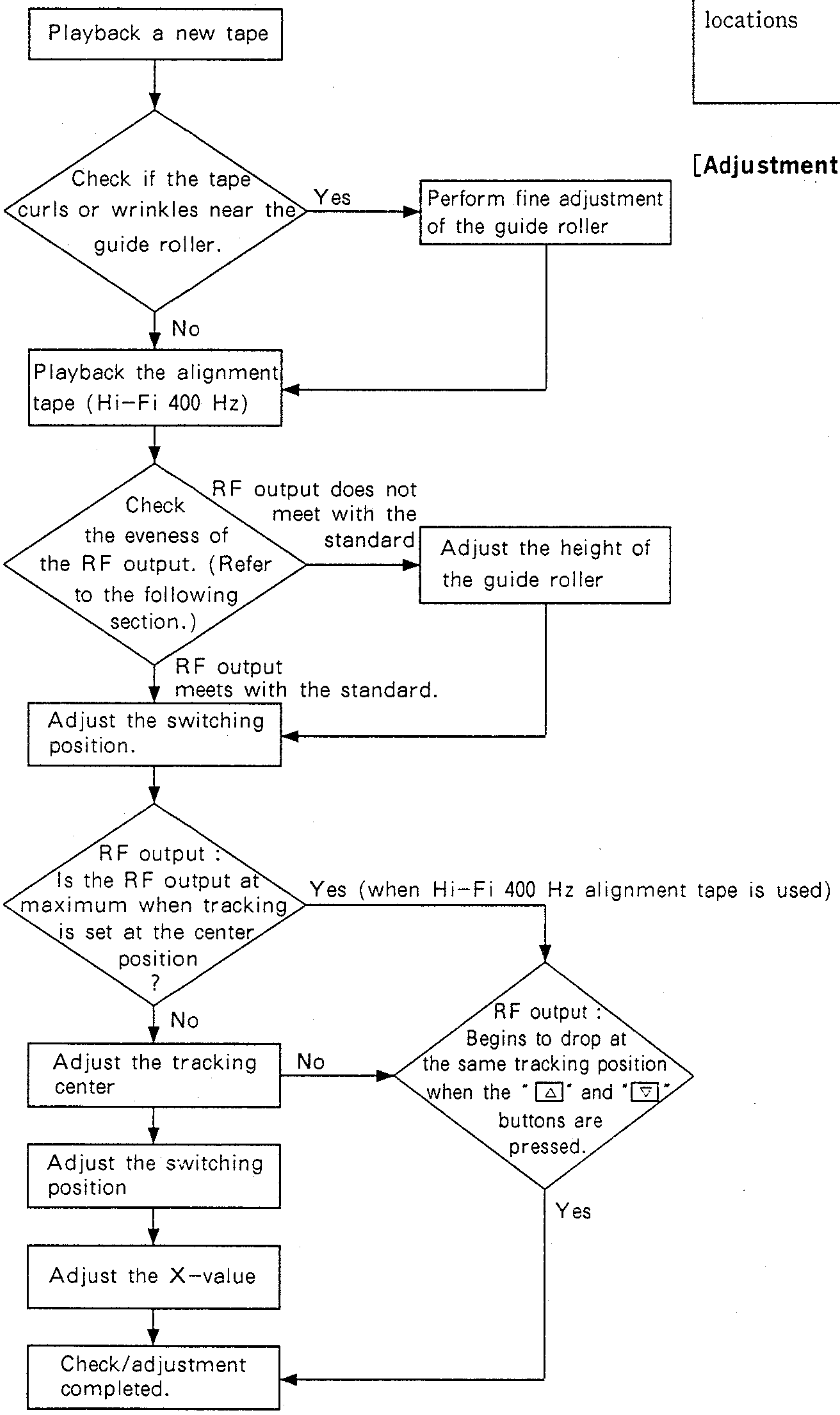
Fig. 4-9.

4-1-8. Adjustments after replacing the drum (video head)

Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Precaution: Turn off the auto tracking and set the manual tracking mode.

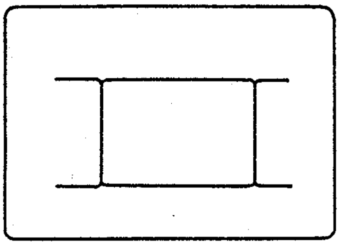
Mode	Playback
Signal	Alignment tape (JVC-MH-1), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller (refer to 4-1-5.) Switching position, Tracking preset, SP delay mono-multi, X-value (refer to 4-1-8) } (Refer to the Service Guide)


Playback a new tape
Check if the tape curls or wrinkles near the guide roller.
Yes
Perform fine adjustment of the guide roller
No
Playback the alignment tape (Hi-Fi 400 Hz)
Check the eveness of the RF output. (Refer to the following section.)
RF output does not meet with the standard
Adjust the height of the guide roller
RF output meets with the standard.
Adjust the switching position.
RF output : Is the RF output at maximum when tracking is set at the center position ?
Yes (when Hi-Fi 400 Hz alignment tape is used)
No
Adjust the tracking center
No
RF output : Begins to drop at the same tracking position when the "△" and "▽" buttons are pressed.
Yes
Adjust the switching position
Adjust the X-value
Check/adjustment completed.

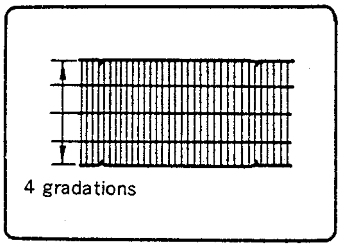
[Adjustment method]

[Checking the eveness and fluctuation of the RF output]

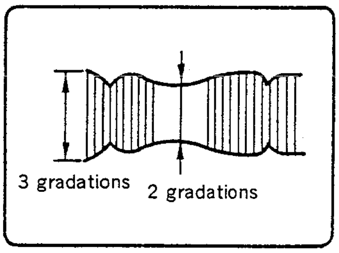
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

4-1-9. Checking the tension and torque

Purpose: To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode without loading a cassette tape. (Refer to section 1-3.)
Measuring instrument	Torque gauge, Torque gauge adapter

Item	VTR operation mode	Reel to be measured	Measurement value
Main brake torque	Stop	Supply and take-up reels	170g•cm or more
Review torque	Review	Supply reel	180±30g•cm (using the torque cassette)
Take-up torque	Playback	Take-up reel	80 to 140g•cm (using torque cassette)
Back tension torque	Rewind	Take-up reel	4 to 25 g•cm

[Check method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

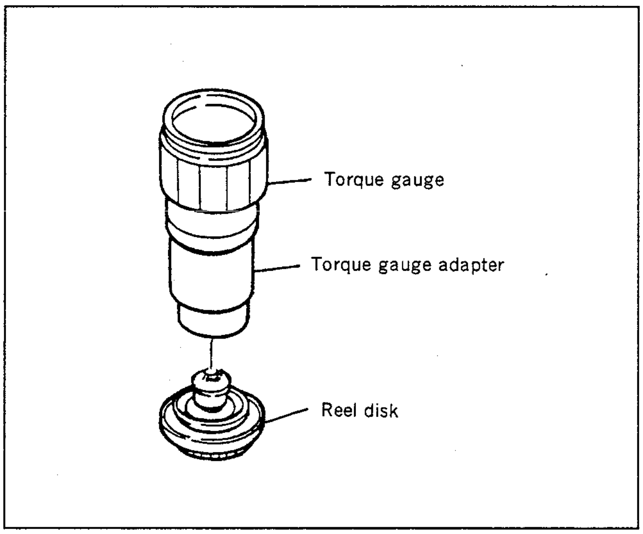


Fig. 4-13.

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